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REVIEWS

The English Hexapla, exhibiting the six important English Translations of the New Testament Scriptures, and the Original Greek after Scholz: preceded by an Historical Account of the English Translations. London, Bagster & Sons.

"Now hear we every man in our own tongue, wherein we were born, the wonderful works of God," was the exclamation of those who witnessed the miraculous effusion of the Holy Spirit on the day of Pentecost. To us, who have obtained the same advantage by the ordinary dispensations of Providence, it must ever be a matter of deep interest to trace the origin and history of those versions of the sacred records, which have rendered the glad tidings they convey available "to us, and to our children." There is more than a literary interest in the historical disquisition prefixed to this volume; and we shall be doing, as we believe, no unacceptable service by collecting from it a summary view of the course of events that has given us the English Bible.

As all our earlier translations, including that of Wyclif, were made from the Latin Vulgate, it will be necessary for us to begin with a brief account of this, the parent of all the western versions; and, avoiding the countless controversies which have been raised respecting its origin and its merits, we shall confine ourselves to the facts which are universally acknowledged, or which rest upon authority that has never been questioned.

The New Testament as we have it, is written in Greek, but there is a continuous tradition that the Gospel of St. Matthew was originally written in Syriac, and that of St. Mark in Latin. Greek, however, was the language of the "Seven Churches of Asia," as it was of all the countries which formed the Eastern Empire; and as Lesser Asia was the stronghold of Christianity during the first two centuries, it was natural that the Scriptures of the New Testament, when first collected, should be presented to the Churches in the language with which they were most familiar. But it is exceedingly probable that the process of translation into Latin, had commenced before the New Testament was formed into a canon. Numbers of Romans and other Italians had settled in Asia Minor; a circumstance which has been little observed, proves them to have been particularly numerous at Antioch; in that city "the disciples were first called Christians;" now *Christian* is a Latin, not a Greek derivative from the word *Christ*, and must therefore have been given by a Latin population. We may further remark, that the first gentile convert was a Roman, Cornelius, "a centurion of the Italian Legion." Hence, to say nothing of the Western Churches, there was in the Eastern Churches a necessity for interpreting the Scriptures to many of the believers; and we find St. Paul enumerating "the interpretation of tongues" among the eminent gifts of the Holy Spirit. This interpretation would of course be employed when an apostolic epistle was received by any of the Churches, for we learn that these were openly read to the congregations, and even communicated to the neighbouring churches. Thus St. Paul, in writing to the Colossians, says, "When this epistle is read among you, cause that it be also read in the

church of the Laodiceans." It may be said that these interpretations do not afford sufficient ground for believing in the existence of a written translation into Latin during the apostolic age; but granting this, they afford strong reason for believing that such a translation, or perhaps several, would be made at a very early period; and other circumstances almost render the conjecture a certainty. We have the same passages of Scripture frequently quoted by the early fathers of the Latin Church; and between these quotations there is a verbal agreement, quite inconsistent with their being separate translations, but showing them to be derived from a common origin.

The *Itala*, as the oldest Latin version of the New Testament is commonly called, does not appear to have been what we should call an "authorized" translation; it was probably made by piece-meal, and as it was wanted. In consequence of this, certain scholia or explanations, which the translator deemed necessary, crept into the text, and the number of these corruptions was multiplied by the custom of interlining short comments or glosses in original manuscripts, at a time when writing materials could not be obtained without great expense and difficulty. In this state of things St. Jerome undertook to correct the text, and his edition of the old translation, is the foundation of that which is now called the *Vulgate*. But it was not until after the lapse of many centuries, that the Latin church possessed an authoritative text; the old copies were too valuable to be destroyed, and Jerome's corrections were interlined in them, as may be seen in a MS. of some of the Epistles in the Harleian Collection, British Museum, (No. 1772,) where the corrections appear to be of a date not long posterior to the original text. Hence there were still many discrepancies in the copies circulated, so that the author of the *Elucidarium Bibliorum*, who was probably a disciple of Wyclif, says, "The commune latyne bibles have more need to be correctyd, than hath the englyshe bible late translated." We may add, that several of the old glosses are still retained in the *Vulgate*, but none of any great importance.

It now remains to give some account of the causes that induced the Western Churches for a long season to prefer the Latin *Vulgate* to the original Greek. Greater familiarity with the Latin language, though a principal, was not the only reason; the schism between the Eastern and Western Churches rendered each suspicious of the language of the other, and some of the writers on the Romish side did not hesitate to charge the Jews and the Greeks with having severely corrupted the original text of the Bible. In fact, the Complutensian editors compare the Latin version which, in their Polyglot stands between the Hebrew and the Septuagint, to Christ crucified between two thieves! An inquiry into the truth of these allegations, and a candid examination of the critical value of the *Vulgate*, especially its older copies, would be a great service to Biblical literature. It is enough at present to say, that from the ninth to the fifteenth century the Scriptures were only known through the medium of a Latin translation to the Western Churches.

The Anglo-Saxon versions of the Scripture were all made from the Latin, and, like that translation, they appear to have been made originally for mere convenience, without any reference to the expediency of circulating the Scriptures among the laity. It is certain that the Anglo-Saxon clergy were diligent preachers; hence we may reasonably suppose that any of them, when preparing to expound a passage of Scripture, would "gloss," or write an interpretation of the most striking words, if not of the whole passage, underneath the text. In fact, there exist several Monastic MSS. which are thus partially interlined in various hands. The practical use of these "glosses," especially to the younger and less learned monks, would naturally suggest the value of a complete version. The oldest extant is an interlinear translation of the four gospels made by a monk named Aldred, in a Latin MS. In this MS., well known as the "Durham Book," antiquarians generally agree, that there was an interval of two centuries between the original text and the interlineation. It is unnecessary to dwell upon the other Anglo-Saxon versions and paraphrases; but we may add, that previous to the Conquest a considerable share of Scriptural knowledge appears to have been possessed by the laity of the English Church, as appears from the many Biblical allusions in works designed for popular use.

It is not necessary to enter on the question whether Wyclif's was the first English translation made, because it undoubtedly was the first published, and that is the only matter worth examining. The editor of the *Hexapla* details at some length the motives which led him to the undertaking; but he omits one, which, even at the present day, is not without its importance. In the few specimens of the preaching of the Mendicant friars that have been preserved, we constantly find several of the legends in the forged "Gospels of the Infancy" mixed with the truths of Evangelical history, and such a hold had these "specious miracles" on the public mind, that they are still preserved by tradition among the peasantry in several parts of England. To show his countrymen what the Gospel really did contain, and to destroy the influence of these idle tales, was a leading object with all the fathers of the Reformation.

Wyclif's version was, as we have said, made from the Latin, and we have also seen that a critical value is claimed for it, beyond that of any Latin version existing at the time. This claim, if established, would greatly enhance the value of Wyclif's version, but the only test by which it can be examined is to compare his translation with the various readings in the Sixtine and Clementine editions of the *Vulgate*, and see how far he anticipated the corrections of the latter. A few instances will be sufficient.

Matthew, iv. 26. The Sixtine reads—"He hath given his angels charge concerning thee, that in their hands they *should* bear thee up," &c. The Clementine more correctly—"and in their hands they shall bear thee up." Wyclif has anticipated the correction "thei schuln take thee in hondis."

Matthew, vii. The Sixtine reads—"Judge not, and you shall not be judged. Condemn not, and you shall not be condemned." The Clementine more correctly—"Judge not, that you be not judged." So also Wyclif—"Nyle ye deeme, and

* "Posuimus tanquam duos hinc et inde latrones, medium autem Jesum."

ye schulen not be demed ;" for though he errs in the mood, he omits the unauthorized addition.

Matthew, ix. 26. After " he took her by the hand," the Sixtine adds, " and said, Damsel arise ;" the unauthorized clause is omitted in the Clementine edition and in Wiclit.

But, Matthew, xxiv. 41, Wiclit agrees with the Sixtine in retaining the unauthorized clause — " Two shall be in one bed ; the one shall be taken and the other left."

Matthew, xxvii. 35. The Sixtine edition omits the reference to the prophecy respecting Christ's garments, but the passage is found both in the Clementine and in Wiclit.

These passages are sufficient to prove that Wiclit translated from a text different from that of both editions of the Vulgate, but whether the difference arose wholly from his own conjectural emendations we have not sufficient evidence to determine.

Passing over several imitations of Wiclit's version, we come to Tyndale's, the first which was translated from the Greek. It was printed abroad, in consequence of the persecution which then raged in England (A.D. 1526), and its use was prohibited by Bishop Tunstall, at the instigation of Cardinal Wolsey. The inquisitions respecting the importation of the volume give us some curious information respecting the profit on the sale of prohibited books in those days. A Dutchman offered three hundred copies to one Necton, at ninepence a-piece ; and Necton says that he received seven or eight groats, and in one case ten groats for a single copy.

In 1534, Tyndale published a corrected edition of his translation (reprinted in the present volume), which he declares that he had " with all diligence compared unto the Greke." A comparison of his version with the original and with the Latin translation will at once prove that he relied chiefly on the Greek ; but he appears to have had great deference for the opinions of Erasmus, and to have adopted from him a system of interpreting the New Testament from classic models, and not making sufficient allowance for the Syriac idioms of the Apostles. This error however is not peculiar to Tyndale : it prevails more or less in all the western translations of the Scriptures.

Tyndale's translation was followed, but not superseded, by that of Myles Coverdale, and both combined were made the basis of the authorized Bible, commonly called " Cranmer's," published under the direct sanction of Henry VIII. The version of the Psalms in our Prayer-Books is taken from this translation. In comparing Cranmer's New Testament with Tyndale's, we find that the latter adheres the more closely to the Greek ; some of those whom Cranmer had employed in the revision having gone back to the authority of the Vulgate. One instance is particularly marked by the editor of the Hexapla. Tyndale renders John, x. 16, — " And other sheep I have, which are not of this fold (αιδηγη). They also must I bring, that they may hear my voice, and that there may be one flock (ποιμην) and one shepherd." For the two Greek words αιδηγη and ποιμην, the Latin has but one rendering *ovile*, which in Cranmer's Bible is in both places rendered *fold*, an error which still continues in our authorized translation.

The next important translation of the New Testament was that made by the English exiles at Geneva, but especially by Coverdale, during the reign of Mary. It displays more scholarship than any of the preceding versions, and it excludes several clauses which had been introduced into Cranmer's Bible from the Vulgate. It is obvious that one object of this new translation was to represent Presbytery as more in accordance with Scripture than Episcopacy.

Thus in Acts, i. 20, where all the other translations have " his bishopric let another take," the Geneva renders it " let another take his office." It was probably for this reason that the revised edition of Cranmer's, usually called " the Bishop's Bible," was published and declared the standard by Elizabeth's prelates. The Geneva translation was however preferred by the Puritans, and continued to be used, at least in private devotions, to a very late period.

The Rheinish translation was made at the instigation of Allen, the great opponent of Elizabeth and the Reformation, whose eminent services to the Papacy were rewarded with a cardinal's hat. It was published at Rheims in 1582, and has ever since been received as a standard version by English Romanists, though it does not appear to have ever received the formal sanction of the Church. It is on the whole a fair version of the Vulgate, but it adheres so servilely to the Latin idiom that in many passages it is utterly unintelligible, and almost merits the sarcasm of being " a translation that needs to be translated."

The history of our " authorized version " may be very briefly told. It was undertaken to prevent the probable triumph of the Geneva version, by removing the objections which were made to the Bishop's Bible. No greater proof of its excellence need be adduced than its reception by nearly all sects of Protestants, both in England and America, and the very trifling nature of the objections urged against it by those most interested in its attack.

We have thus gone through some particulars of the history of the six versions of the New Testament contained in this volume, without giving any opinion on their comparative merits. A comparison between them, and a critical examination of the points on which they differ, would be a beneficial exercise for a Biblical student ; but we could scarcely undertake it without entering on controversial ground, from which we are withheld equally by duty and inclination.

The ' Hexapla ' has been very carefully edited, and it is a most creditable specimen of typography ; we trust that the sale will remunerate the spirited proprietors.

The Lowell Offering : a Repository of Original Articles, written by Females employed in the Mills. Nos. 1, 2, 3. Lowell, Mass., Powers & Bagley.

We have not forgotten Miss Martineau's interesting picture of the habits and manners of the factory-girls of New England ;—how they " looked like well-dressed young ladies," and in place of the bandana handkerchief, the established Lancashire *coiffure*, wore " calashes, in going to and fro between their dwellings and the mill,"—how some had gathered together libraries—others " cleared off mortgages from their fathers' farms —others educated the hope of the family at college." Well might Miss Sedgwick, intimately acquainted with such a condition of plenty and civilization, remark with sad surprise the care-worn faces of our operatives, and the discrepancy between the troops of beggars and the highly-dressed cottage gardens which English highways present ! But yet more than by the pictures of the English, or the astonishment of the American authoress, is the wide discrepancy between the new and the old country brought home to us, by this magazine, written, as we English should say, by " the factory-girls at Lowell," or, as its own title-page sets forth, by " Females employed in the Mills." The very manner of its issue is characteristic. The cover, in place of bookseller's puff, bears the recommendation of the Mayor and other worshipful inhabitants of the town. The prospectus of its conductor announces that it does not, and shall not, contain " a sentence of sectarianism and partyism" in any form ; and on the yellow or blue wrapper of every number flaunts, by way of illustration, a coarse, but apparently faithful woodcut of one or other of the Lowell churches—St. Anne's Episcopal Church, the Baptist Church, the Methodist Church, &c. Nor do the contents wholly contradict the promise thus furnished of something in itself racy and noticeable, besides being valuable as an exponent of a state of society, to which we have nothing analogous. Remembering the garb of fustian and tinsel in which the imagination of most literary aspirants, especially in the humbler classes, is apt to walk abroad, we were somewhat surprised to find how little the Tabithas and Lisettes of the Lowell mills indulged in rhapsody and sentiment. Romance enough there is in their compositions ; but it takes a form of its own—a form wholly American, as we have a right to insist,—from a recollection of certain English periodicals written by women, and some experience of the poetry which English operative women have added to the shelf adorned by the works of Elliot and Millhouse and Ragg. A rich husband, and a handsome silk dress, figure, it is true, somewhat too largely in the visions of the Lowell nymphs, but then there is as much wide-awake talk of the intellectual and moral advantages they are able to earn for themselves by factory labour,—lessons in music, lessons in French, and the like. Again, in place of the whiskered heroes and the pink-and-white heroines of the Clares and the Clementines of our Ladies' Museums, the reader will find figures exclusively American,—the homely, thriving patriarch,—the " school ma'am," with her pedantic modes of demeanour and instruction,—and glimpses of Thanksgiving and Forefathers' Day, and of those other festivities and celebrations, in which, be their form even as bald and uninviting as that of a Quaker festivity, the poetry of the genial human heart will somehow or other disclose itself. Nor is the literary merit of these portraiture despicable. We shall take one, not because it is the best, but because in its tone and style it justifies and illustrates the tone of the foregoing remarks :—

" The First Wedding in Salmagundi.

" I have often heard this remark : ' If their friends can give them nothing else, they will surely give them a wedding.' As I have nothing else to present at this time, I hope my friends will not complain if I give them an account of the first wedding in our town. The ceremony of marriage being performed by His Excellency the Governor, it would not be amiss to introduce him first of all. Let me then introduce John Wentworth, (the last Governor of New Hampshire while the colonies were subject to the crown of Great Britain,) whose country-seat was in Salmagundi. The wedding which I am about to describe was celebrated on a romantic spot, by the side of Lake Winnipesaukee. All the neighbours within ten miles were invited, and it was understood that all who came were expected to bring with them some implements of husbandry, such as ploughs, harrows, yokes, bows, wheelbarrows, hods, scythes, scythes, maces, goads, hay-hooks, bar-pins, &c. These articles were for a fair, the product of which was to defray the expenses of the wedding, and also to fit out the bride with some household furniture. All these implements, and a thousand and one besides, being wanted on the farm of Wentworth, he was to employ persons to buy them for his own especial use. John O'Lara, an old man, who used to chop wood at my father's door, related the particulars of the wedding one evening, while I sat on a block in the chimney-corner, (the usual place for the greatest rogue in the family,) plying my knitting needles, and every now and then, when the eyes of my step-mother were turned another way, playing slyly with the cat. And once, when we youngens went upon a whortleberry excursion, with O'Lara for our pilot, he showed us the spot where the wedding took place, and described it as it was at the time. On the right was a grove of birches ; on the left a grove of bushy pines, with re-

cesses for the cows and sheep to retire from the noon-day sun. The back ground was a forest of tall pines and hemlocks, and in front were the limpid waters of the 'Smile of the Great Spirit.' These encircled about three acres of level grass-land with here and there a scattering oak. 'Under yonder oak,' said O'Lara, 'the ceremony was performed; and here, on this flat rock, was the rude oven constructed, where the good wives baked the lamb; and there is the place where crotched stakes were driven to support a pole, upon which hung two huge iron kettles, in which they boiled their peases. And on this very ground,' said O'Lara, 'in days of yore, the elves and fairies used to meet, and, far from mortal ken, have their midnight gambols.' The wedding was on a fine evening in the latter part of the month of July, at a time when the moon was above the horizon for the whole night. The company were all assembled, with the exception of the Governor and his retinue. To while away the time, just as the sun was sinking behind the opposite mountains, they commenced singing an ode to sunset. They had sung,

The sunset is calm on the face of the deep,
And bright is the last look of Sol in the west;
And broad do the beams of his parting glance sweep,
Like the path that conducts to the land of the blest—

when the blowing of a horn announced the approach of the Governor, whose barge was soon seen turning a point of land. The company gave a salute of nineteen guns, which was returned from the barge, gun for gun. The Governor and retinue soon landed, and the fair was quickly over. The company being seated on rude benches prepared for the occasion, the blowing of a horn announced that it was time for the ceremony to commence; and, being answered by a whistle, all eyes were turned towards the right, and issuing from the birchen grove were seen three musicians, with a bagpipe, fife, and a Scotch fiddle, upon which they were playing with more good nature than skill. They were followed by the bridegroom and grooms-man, and in the rear were a number of young men in their holiday clothes. These having taken their places, soft music was heard from the left; and from a recess in the pines three maidens in white, with baskets of wild flowers on the left arm, came forth, strewing the flowers on the ground, and singing a song, of which I remember only the chorus:

Lead the bride to Hymen's bowers,
Strew her path with choicest flowers.

The bride and bridesmaid followed, and after them came several lasses in gala dresses. These having taken their places, the father of the bride arose, and taking his daughter's hand and placing it in that of Clifford, gave them his blessing. The Governor soon united them in the bonds of holy matrimony, and as he ended the ceremony with saying 'what God hath joined let no man put asunder,' he heartily saluted the bride. Clifford followed his example, and after him she was saluted by every gentleman in the company. As a compensation for this 'riling of sweets,' Clifford had the privilege of kissing every lady present, and beginning with Madam Wentworth, he saluted them all, from the gray-headed matron to the infant in its mother's arms. The cake and wine were then passed round. Being a present from Madam Wentworth, they were no doubt excellent. After this refreshment, and while the good matrons were cooking their peas and making other preparations, the young folks spent the time in playing 'blind-man's-buff' and 'hide and go seek,' and in singing Jemmy and Nancy, Barbara Allen, The Friar of orders gray, The Lass of Richmond Hill, Gildoroy, and other songs which they thought were appropriate to the occasion. At length the ringing of a bell announced that dinner was ready. 'What dinner at that time of night?' perhaps some will say. But let me tell you, good friends, (in Johnny O'Lara's words,) that 'the best time for a wedding dinner is when it is well cooked, and the guests are ready to eat it.' The company were soon arranged around the rude tables, which were rough boards, laid across poles, that were supported by crotched stakes, driven into the ground. But it matters not what the tables were, as they were covered with cloth, white as the driven snow, and well loaded with plum puddings, baked lamb, and green peas, with all necessary accompaniments for a well ordered dinner, which the guests complimented in the best possible manner, that is, by making a hearty meal. Dinner being ended, while the matrons were putting all things to rights, the young people

made preparation for dancing; and a joyous time they had. The music and amusement continued until the 'blushing morn' reminded the good people that it was time to separate. The rising sun had gilded the sides of the opposite mountains, which were sending up their exhalations, before the company were all on their way to their respective homes. Long did they remember the first wedding in our town. Even after the frosts of seventy winters had whitened the heads of those who were then boys, they delighted to dwell on the merry scenes of that joyful night; and from that time to the present, weddings have been fashionable in Salmagundi, although they are not always celebrated in quite so romantic a manner."

Further to draw extracts from this miscellany is not necessary. The indication of its existence (our article amounts to little more) can hardly pass, without attracting the attention of those who concern themselves in the well doing and progress of our manufacturing classes.

Beltz's Memorials of the Order of the Garter.

[Concluding Notice.]

HAVING disposed, and, to our minds at least, satisfactorily, of the date of the institution of the Order of the Garter, we shall now inquire into the history of its extraordinary title, symbol, and motto, on which matters we have been disappointed in not finding any new information in Mr. Beltz's work. His laborious researches having failed to discover any fact not previously known, it must, we fear, be inferred that no additional light can be thrown on Edward the Third's motive for founding the Society, or on the cause of his having assigned to it so unwarlike a name, and so singular an ensign. All that occurs in the 'Memorials' on this, the most interesting part of the subject, is as follows:—

'Of the principle which governed the nomination of the first knights-companions, we know as little as of the form in which the election was conducted. The name of Sir Reginald Cobham, Sir Walter Manny, the Earls of Northampton, Hereford, and Suffolk, had been established by their exploits, long before the institution of the Order; and would have amply justified their admission amongst the Founders, if military merit had been the sole qualification. Those distinguished captains of the age were elected subsequently upon vacancies created by the deaths of persons of less apparent pretensions. Is it, therefore, an improbable conjecture (more especially considering the youth of several of the primary knights, and the small celebrity of others), that the distinction was, in the first instance bestowed upon those who had excelled at the jousts which shortly preceded the foundation? Whether, at some ball, pending the festivities with which the evenings after those chivalrous exercises were concluded, the incident related by Polydore Vergil, and which is said to have given occasion for the adoption of THE GARTER as the name and the symbol of the Order, actually occurred, is at this day not capable of proof. That author was, as far as we have discovered, the first who asserted (possibly upon a vague hint of Belvaleti, that the foundation had been in honour of the female sex), that the garter of the queen, or of some lady of the court, falling off casually whilst she danced, the monarch had taken it from the ground, and, observing the smiles of the courtiers at what might have been considered an act of gallantry, had exclaimed 'HONI SOIT QUI MAL Y PENSE'; adding that the garter should soon be held in such high estimation, that they would account themselves happy if permitted to wear it. The object of the king's attention on this occasion has been imagined by Speed, Baker, and Camden, (upon the sole authority, as it would seem, of Polydore Vergil,) to have been a Countess of Salisbury; and the learned Selden, following in the same dubious track, conjectured that the lady was Joan Plantagenet, the fair maid of Kent, whom he designates "Countess of Kent and Salisbury," without adverting to the facts that she did not succeed to the former of those earldoms until after the death of her brother, John Earl of Kent, in 1351, and that she never had any legal interest in the latter. The supposed connexion of a Countess of Salisbury with the institution of the Order, had undoubtedly its foundation in Froissart's

romantic episode of the passion conceived by King Edward for the wife of William Montacute Earl of Salisbury. The lively chronicler, who deemed the fame of a knight without amours to be far from complete, appears to have credited with avidity any rumour, which may have been in circulation, of the attachment of the monarch for the lady in question. Its probability has been denied chiefly upon the ground of her advanced age at the time when Edward is stated to have declared himself her admirer. A consideration, however, of the dates may go far to remove such an impression; and, although Froissart has as usual mistaken names and localities, he is borne out by evidence in regard to parts of his narrative.'

After entering fully into the state of the Earl of Salisbury's family at the time, Mr. Beltz proceeds:—

"In the preface to 'Liber Niger,' compiled in the reign of Henry VIII., the following event is presumed to have been in the recollection of the royal Founder when he selected a garter for the symbol of his Order:—It is there alleged (but upon what ancient authority, if any, the researches of Selden had not discovered) that King Richard I., whilst his forces were employed against Cyprus and Acre, had, through the mediation, as he imagined, of St. George, been inspired with fresh courage and the means of animating his fatigued soldiery, by the device to tie about the legs of a chosen number of knights a leatheren thong or garter; in order that, being thereby reminded of the honour of their enterprise, they might be encouraged to new efforts for victory. To this supposed occurrence the adoption of the Garter, as the ensign of the Order, was ascribed by John Taylor, Master of the Rolls, in his address to Francis I., King of France, at his investiture with the ensigns in 1527; which affords additional proof, if any were wanting, of the uncertainty prevalent at that period on the subject. Edward is, by other authors, presumed to have adopted this idea of his predecessor, by giving his own garter for the signal of a battle in which he proved victorious; and to have fixed on a garter as the symbol of the Order in memory of the victory. Du Chesne supposes the battle in question to have been that of Cressy; but without any authority for the conjecture. Amidst such various speculations, and in the absence of positive evidence upon the point, we shall adopt an opinion which has been formed by other writers, that the Garter may have been intended as an emblem of the *tie or union* of warlike qualities to be employed in the assertion of the Founder's claim to the French crown; and the motto as a retort of shame and defiance upon him who should think ill of the enterprise, or of those whom the King had chosen to be the instruments of its accomplishment. The taste of that age for allegorical conceits, imprese, and devices, may reasonably warrant such a conclusion."

It is our misfortune to differ from Mr. Beltz in this opinion, as much as we have done respecting the date of the institution. His conjecture rests almost entirely upon the supposition that the Order was founded previous to Edward's assertion of his right to the French crown, and before his invasion of France in July 1346; but if we have succeeded in showing that the Fraternity was not organized until the close of 1347, or early in 1348, we apprehend that we shall also have done much towards destroying Mr. Beltz's hypothesis about its name and ensign. Our own opinion is, we confess, strongly in favour of the popular story of the Lady's Garter. Though, as Mr. Beltz says, it cannot be traced to an earlier written authority than Polydore Vergil, who lived in the reign of Henry the Seventh, yet none of the other accounts of the origin of the Order occurs until after that period. In the absence of positive evidence, the most probable conjecture, founded on the manners, feelings and customs of the age, is deserving of attention; and the circumstance related by Polydore Vergil is the only one which seems to be consistent with a Garter, and so peculiar a motto—"Dishonoured be he who thinks ill of it,"—having been made the principal ornament

of the dresses used at the Christmas festivities in 1347, and subsequently adopted as the ensign of the noble Fraternity. Ashmole rejects this account, because, as he says, the Order had no relation to the female sex, "not so much as obliging them to defend the quarrels of ladies," while other writers seem indignant at the idea that its Badge could have arisen from so trifling, if not indecent, a cause. It is a sufficient reply to Ashmole to observe, that the Order bore a peculiar relation to the fair sex, because ladies were actually members of the Society, and wore similar robes to those of the Knights; while the defence of woman was one of the principal obligations of chivalry. The adoption of a Garter as the badge of the Order does not necessarily imply that a lady's misfortune and Edward's gallantry were the only reasons for founding the institution. As the sagacious Selden has suggested, Edward might have previously intended to create a Knightly band, and have only availed himself of this affair to perpetuate his adroitness by making the immediate subject of it, and his exclamation on the occasion, the symbol and motto of the Order. To show the prevalence of devices and mottos, and Edward the Third's fondness for such conceits, and at the same time to afford our readers some insight into the manners of the age, we shall give a translated description of the articles furnished out of the Royal Wardrobe for the hastiludes and other sports in 1347 and 1348, which contain the earliest notices of Garters being used as Badges or ornaments on dresses, and of the well-known Motto of the Order:—

"Vizards were provided for the King, earls, barons, knights, and ladies, for the jousts at Canterbury; and materials were supplied for making for the King a bed of blue taffeta, powdered with garters, containing the motto, *Qui soit q mal y pense*. For making a mantle, surcoat, tunic, and hood, for the King's body, of long blue cloth, powdered with garters, furnished with buckles, and pendants of silver gilt. For making fourteen tunics and as many hoods of short blue cloth, for the jousts of Bury; and for making a doublet of yellow and blue velvet, for Lionel, the King's son, against the jousts of Windsor, and other articles for the Lords John of Gaunt, and Edmond of Langley. For the King's plays [ludos] at Guildford, at Christmas 1347, were used thirty-four tunics of buckram, of divers colours; forty-two vizards of divers forms, twenty-eight crests, fourteen painted cloaks, fourteen dragons' heads, fourteen white tunics, fourteen peacocks' heads with wings, fourteen tunics painted with peacocks' eyes, fourteen swans' heads with their wings, fourteen tunics of painted linen, fourteen tunics ornamented with stars of beaten gold and silver, fourteen likenesses of women's faces, fourteen likenesses of men's faces with beards, fourteen likenesses of angels' heads gilded, fourteen crests with legs reversed and shod, fourteen crests with mountains and conies, fourteen painted cloaks, fourteen dragons' heads, fourteen tunics painted white, and fourteen peacocks' heads. Materials were likewise furnished for making a harness for the King's body, of the arms of Sir Thomas de Bradeston, powdered with roses, and other work in silk, for the King's jousts at Lichfield. For making twelve garters of blue, embroidered with gold and silver, each having the motto, *Qui soit q mal y pense*. For making five hoods of long white cloth, for the King, worked with blue men dancing, buttoned before with buttons of great pearl; whereof he gave one to the Earl of Lancaster, one to Sir Hugh de Courtenay, one to Sir John Grey, and another to Sir John de Lisle. For making three harnesses for the King, two of which were of white velvet, worked with blue garters, and diapered throughout the field, with wild men; and a third harness of Indian velvet, worked with garters. For making a harness for David, King of Scotland, of blue velvet, with one pale of red velvet, within which was a white rose, for the King's guests at Windsor. For making divers equipments for the body of the King and his companions, for the jousts at Canterbury, in 1348, where the King gave

eight harnesses of Indian sandal, impressed with the arms of Sir Stephen de Coayngton, to the Prince, the Earl of Lancaster, the Earl of Suffolk, John de Grey, John de Beauchamp, Robert Maulay, John Chandos, and Sir Roger de Beauchamp. Other articles were likewise furnished, for making eight tunics and eight hoods for the Knights, and twelve gowns for ladies entering the city of Canterbury, for the jousts above mentioned. For the King's plays at Oxford, at Christmas 1348, there were provided twelve men's heads, and above them as many lions' heads, twelve men's heads and as many elephants' heads, twelve men's heads with bats' wings, twelve wild men's heads, seventeen virgins' heads, fourteen surcoats of red worsted, ornamented with gold and linen, and as many tunics of green worsted. Articles were also furnished for making for the King a harness of white buckram, inlaid with silver, namely—a tunic and shield, with the King's motto:—

*Day, day, the Wythe Swan,
By Godes soul I am thy man.*

At the King's plays, at Merton, in January 1349, thirteen vizards with dragons' heads, and thirteen masks with men's heads crowned, were used. The Wardrober likewise accounted at that time for materials delivered for a tunic, cloak, and hood for the King, with 100 garters, furnished with buckles, bars, and pendants of silver; for making a doublet of white linen cloth, having about the cuffs and edge a border of long green cloth worked with clouds and vines of gold, with the King's motto thereon.—*Et s'as it is*. In 1364 the King presented the Queen with two richly ornamented corslets, one having on it the Queen's motto, *Ellyn bidemye*, and on the other the motto *Eche brude mythe*."

It would certainly be extraordinary that an anecdote so well suited to the taste of Froissart should not have found a place in his pages, were it not that the mistakes he has made in his account of the Order show him to have been very imperfectly informed on the subject; and it is to be remembered that he gives no account whatever of the origin of the name or ensign, and that he does not even mention the motto. The statutes are also silent on those points; and it was not until the middle of the reign of Henry the Eighth, when the 'Liber Niger' was compiled, that the records of the Order contain any account of its institution; but as the compiler of that book was a grave Doctor of Divinity, and soon afterwards a Bishop, it was to be expected that he should have preferred any other cause to which its origin could possibly be attributed, than the fall of a lady's garter and a monarch's gallantry. The most popular, and, in our opinion, most probable, history of the symbol and motto is, therefore, also the most ancient one; and as Polydore Vergil can scarcely be supposed to have invented it, the anecdote must have been handed down by tradition, or have occurred in one of the many chronicles that perished at the dissolution of the monasteries. Hume has well said—"This origin, though frivolous, is not unsuitable to the manners of the times; and it is indeed difficult by any other means to account either for the seemingly unmeaning terms of the motto, or for the peculiar badge of the Garter, which seems to have no reference to any purpose either of military use or ornament." It would, however, require more space than we can afford to state all the reasons which support that tradition; and we shall only add, that it will continue to deserve credence until a conjecture more consistent with the motto and with the sentiments of the fourteenth century be suggested.

Mr. Beltz's summary of the history of the Order contains little that is new, or which calls for observation. A manuscript in the Royal Library of Paris has furnished him with some curious letters respecting a challenge from Sir John de Werchin, Seneschal of Hainault, to the Knights of the Garter. But Henry the Fourth—"in a gracious reply, condescended to remind the seneschal that it was nowhere asserted, in the ancient histories of the Round Table, that the members

of that society had gone forth to encounter a single stranger-knight; but that, on the contrary, it appeared that frequently one of them had encountered from ten to forty knights from foreign countries, and honourably acquitted himself, with God only and the noble prowess of his own heart to protect and aid him in the perilous enterprise. The king, therefore, did not think fit to assent to the seneschal's proposal; but offered to permit one of the knights of the Garter to accept his challenge on an appointed day, within the walls of London. The seneschal came to London with a splendid retinue, and the jousts were held in Smithfield, in 1408. The knight of the Order, who proved victorious in his combat with the noble visitor, was John Beaufort earl of Somerset."

Our readers will however rather hear something about their old friend Sir John Falstaff, or more properly Fastolf, from whose "craven leg" Shakespeare, for his alleged cowardice at the Battle of Patay, in 1429, makes Lord Talbot "tear the garter." Mr. Beltz says,—

"The stain which, from his asserted flight at the battle of Patay in 1429, attached to the otherwise unblemished military reputation of Sir John Fastolf, was deep in proportion to the height of his previous renown. It has never been doubted that Shakespeare had in his recollection the exaggerated reports, both written and traditional, of this incident, when, with a slight variation of the name of the gallant knight, he attributed cowardice as a prominent vice to one of the most ably-drawn and consistent characters of his drama. A contemporary historian has, however, placed the conduct of our knight of the Garter, on the occasion in question, in a point of view less unfavourable to his memory: Jean Waurin seigneur de Forrester, who, having been directed by the regent duke of Bedford to join the retinue of Fastolf, and who served near his person in the battle, may be considered as an unexceptionable witness of the demeanour of his illustrious principal on that memorable day. In his circumstantial history of the eventful period, he relates that the English being besieged in Beaugency, Talbot found means to enter the town with 40 lances and 200 archers; and, having alighted at his hotel, Sir John Fastolf, with Sir Thomas Rempton and others, went to welcome him. After dinner they held a council of war, at which Fastolf, whom he describes as a most valiant and wise knight, expressed his opinion that, considering the present strength of the enemy, and the depressed state of the English from the losses sustained before Orleans, Gergeaux, and other places, they should allow the inhabitants of Beaugency to make the best terms they could with the French, and that the troops of the regent should await the reinforcement which he had promised to send, before they courted another conflict. This advice was not agreeable to his auditors, and especially to Talbot, who declared that, should even his numbers be limited to his own personal retinue, he was determined to make a sally from the gates, and rely upon the succour of God and St. George for the result. Fastolf again reminded the council that, if fortune should prove adverse, all the French conquests, achieved with so much labour by the late king, would infallibly be placed in extreme jeopardy; but, finding his remonstrances unheeded, he prepared for the conflict, and ordered the army to march out of the town, and to take the direct road to the neighbouring town of Meun. The French, composed of about 6,000 men, under the command of the Maid of Orleans, the duke of Alençon, the bastard of Orleans, the marshal de la Fayette, La Hire, Pothon, and other captains, observing the approach of the English, formed, in order of battle, upon a small eminence. The English having also disposed themselves in battle array, sent two heralds to challenge the enemy to descend from their position; but were answered that, it being late, they might take their rest until the morrow. Whereupon the English proceeded to Meun for the night, and the French entered Beaugency. In the morning battle was joined on the field of Patay; the English were overpowered by numbers, and fled; and Fastolf, in the hearing of Waurin, the relator, was urged to save himself, as the day was entirely lost. He, however, desired at all hazards to renew the conflict, declaring his resolution to abide the issue in whatever manner it might please God to

order that to a remain Talbot that made and follow reach of his Fastol in a whom the C having removed in the excuse stored up release par Paris. We us will degrade that accords been neither vation not merely express the K agree "par is, that or did Chapter ample pronoun Anstis nown gation King reign cloquement "He and if, suddenly reflected the function, who sent it seven nigh gushed the fury of in und scold, more vac At the necessary and par a female been re the King might be Queen's the star more pro shoulder We er on the in when the first to that we much them to again en to which "The S day 1805 splendour adding to

order it, saying, that he preferred death or capture to a disgraceful flight and the abandonment of his remaining retinue. But having ascertained that Talbot was a prisoner and all his people slain, and that 2,000 of the English had fallen and 200 been made prisoners, he took the road towards Estampes, and Waurin adds 'et moy je le suivia.' On the day following the battle, continues the historian, news reached the Duke of Bedford at Paris of the defeat of his army, the capture of Talbot, and the flight of Fastolf, who was arrived at Corbeil. From thence, in a few days, he repaired to the regent at Paris, by whom he was sharply reprimanded and deprived of the Order of the Garter which he wore. The Duke having, however, afterwards received a report of the remonstrances made by our Knight to his companions in the council, and other reasonable and approved excuses, the Garter, was 'par sentence de proces,' restored to him; upon which account much dispute arose between him and the Lord Talbot, after the release of the latter from prison.—*Chron. d'Angleterre, par Waurin, MS. No. 6,748, in the royal library at Paris, vol. v. chap. xii-xiv.*

We are sorry that Mr. Beltz has not favoured us with his opinion whether Fastolf was actually degraded from the Order. Our impression is, that the indignity never took place, because, according to the statutes, it could only have been done by the sentence of a chapter, (for they neither authorize suspension nor personal deprivation); because the register of the Order does not mention the circumstance; and because it expressly states that in May 1430 he was one of the Knights. The latter fact would certainly agree with the statement that he was restored 'par sentence de proces'; and perhaps the truth is, that the Duke of Bedford intended to accuse, or did actually charge Fastolf with cowardice in a Chapter of the Order; but that, having adduced ample proof of his personal bravery, he was pronounced guiltless of the heinous offence. Anstis has, however, so ably defended the renowned Knight, that it would be mere supererogation to enter farther into the question.

King Edward the Fourth's succession as Sovereign of the Order is described in the following eloquent passage:—

"He entered, therefore, the Order as SOVEREIGN: and if, on the splendid seat to which fortune had so suddenly raised him, the mind of the young monarch reflected for a moment that loyalty and union were the fundamental principles of that illustrious fraternity, what an appalling contrast would have presented itself! Within the brief space of a few months, seven members of the society, with his own distinguished father at their head, had fallen victims to the fury of intestine warfare; others were still contending under opposite banners; and the sword, the scaffold, and proscription, occasioned shortly four more vacancies in the stalls of St. George's chapel."

At the accession of Queen Anne, it became necessary to decide in what manner the ensigns, and particularly the Garter, should be worn by a female sovereign; and the question having been referred for the consideration of seven of the Knights, they reported that "the George might be worn pendant from a ribband about the Queen's neck, the Garter on her left arm, and the star upon her breast." Her present Majesty, more properly, wears the ribband over the left shoulder, like the Knights.

We entirely approve of Mr. Beltz's remarks on the injudicious and unnecessary alteration in the constitution of the Order in 1768, when the number of the Knights was, for the first time, extended; and his objections to that increase are so forcibly expressed, that we much wish our space enabled us to transfer them to these pages. In 1805 the Order was again enlarged, but assuredly not for the reason to which Mr. Beltz ascribes the extension:—

"The Sovereign, intending to celebrate St. George's day 1805 by an installation, and conceiving that the splendour of the ceremony would be increased by adding to the number of the Knights to be installed,

resolved to follow the precedent of 1786 by ordaining a further enlargement of the Order."

We now approach that part of the 'Memorials' in which the author's labours have been attended with more success than in his investigation of the institution of the Order, and where we find much that is original and important. Every catalogue of the Knights hitherto printed, is more or less erroneous; and though we do not take upon us to assert (nor does Mr. Beltz put forth such a claim) that the present list is absolutely perfect; yet it is, undoubtedly, the most accurate one that has been compiled. The pains and research which it must have cost, are evidently great; and though its author was more indebted to Anstis than is always apparent, he has deserved much that was unknown.

In making this general acknowledgment of the merits of Mr. Beltz's list of the Knights, we must not, however, be understood as assenting to all his opinions or corrections; but our doubts could not be stated, without much minute criticism. It occurs to us, that he has rejected some persons, though there is precisely the same evidence of their having belonged to the Order, as of others whom he has included; that he has relied too implicitly on the Knights having continued members of the Fraternity from the time of their election until their decease, without allowing for possible resignations or expulsions; and that he attaches rather more credit to the Windsor Tables than they seem to deserve, though the proof which he has found, that Tables containing the names of the Knights of the Garter, if not the identical tables referred to, existed as early as the reign of Henry the Fourth, imparts greater importance to them than they had hitherto possessed. One of the new Knights discovered by Mr. Beltz, is the Duke of Ireland, the well-known favourite of Richard the Second; and he has brought to light the name of another—Inigo d'Avalos, Count of Mount Odorisio, or Orizio—whose election is recorded in the 'Liber Niger,' but whose real name eluded the research of all previous writers on the Order.

The obscurity respecting Count Orizio evidently arose from the error of some transcriber, in mistaking a capital *O* for a *G*, and a *u* for an *n*, (blunders which every archeologist knows to be very easily committed), the Knight in question having hitherto been described as the Count of Monte Grison.

An interesting feature of the 'Memorials,' is a list of the Ladies who have belonged to the society, which comprises sixty-two females, mostly of the highest rank; but we have no doubt that numerous other ladies, including probably the wives of all the Knights, were originally, and for a long period, Members of the Order. The custom of admitting ladies ceased, we believe, in the reign of the English Blue Beard,—Henry the Eighth,—a fitting author of the abolition of any institution that rendered homage and did honour to the fair sex. It was intended, Mr. Beltz informs us, to revise the practice in 1638, but the civil wars prevented the design from being accomplished. The present moment, when an illustrious female presides over the Order, and when woman, by her virtues and talents, has been raised to a higher position in society than she ever before attained, would seem to be very appropriate for reviving the most chivalrous part of the institution, and which is manifestly incomplete without so graceful an addition.

We have left ourselves but little room to notice Mr. Beltz's valuable contribution to the biography of the fourteenth century, in his well written memoirs of the Knights elected during the reigns of Edward the Third and Richard the Second. The labour of collecting from records the facts of which those memoirs

consist, can only be appreciated by persons who have made the trial, and (except the error in the lives of the twenty-five original founders, that they were all elected in April 1344) those articles are as much distinguished by accuracy, as by perspicuity and elegance. Few works are more to be desired than the completion of these memoirs by the same pen. The lives of all the Knights of the Garter would present an account of many distinguished men, of whose career the history has never been written; and nothing would be more likely to increase Mr. Beltz's well earned reputation than such a publication.

The History and Antiquities of the Seigniory of Holderness, in the East Riding of the County of York, including the Abbeys of Meaux and Swine, &c. By George Poulsen, Esq. 4to. Vol. I. Part 2, and Vol. II. Part 1. Hull, Brown; London, Pickering.

The opinion expressed in our notice of the first portion of this work (*Athen. No. 700*), may be applied to the present; but the expectation that the future parts would probably afford materials for extracts of a more attractive character than those which we then laid before our readers, has been disappointed. Dulness pervades every page; and it is hardly possible to find one statement, or one passage, of the slightest interest to any person unconnected with the locality.

These Parts contain, under 'The Parochial Division,' the North and Middle Bailliwick of the Seigniory, and numerous Pedigrees, together with every fact which the author's industry and research could collect, as well from the public records as from parochial and manorial documents. Mr. Poulsen gives the following account (with an engraving) of a remarkable relic discovered in the parish of Roos:—

"In the year 1836, some labourers, who were employed in cleaning a dike or ditch, which had been made some years previously, in a field belonging to Mr. John Bilton, in Roos Carrs, west of the mill, discovered, about six feet below the surface, in a bed of blue clay, a group of figures rudely carved in wood, and as rudely put together. The base or foundation of the group being a serpent, on the back of which were eight human figures, fixed by the feet into holes bored in the figure of the serpent, which was bent so as somewhat to resemble the shape of a canoe or boat; the head of the snake forming the prow, and having eyes of small pieces of quartz. The figures were closely crowded, and nearly similar, the only difference being in their height. Each figure represented a warrior, apparently entirely naked, armed with a club, and carrying two round shields, a larger and a smaller one; the eyes of each warrior being, like those of the serpent, formed of small pieces of quartz. An accurate drawing of one of these groups has been submitted to some learned and leading antiquaries, none of whom, however, have been able to say exactly what is alluded to by these rude and curious relics of a barbarous age; but they are generally supposed to have been left in commemoration of the descent of one of those piratical hordes who, in former times, poured in from Scandinavia upon different parts of the English coast, and carried into the interior the most horrible devastation by fire and sword. The serpent is evidently allegorical, and is by some supposed to allude to the ship which brought the pirates over; by others, to their leader. Perhaps both surmises are in some degree correct. Snorre Sturleson, scald or bard to Haco, fourth king of Norway, states, among the supernatural powers of the first great Scandinavian chief, Odin, that he could assume the form of a serpent, and transport himself great distances in incredible short space of time. * * Harald succeeded Haflane, A.D. 863. Hoveden, and the Saxon Chronicle say, the battle in which Ella, the new king of Bernicia, in an attempt to recover the city of York from the successful Danes, failed and was killed, was fought 21st March, A.D. 867. It may, therefore, not be presuming too much to assign the deposit of these curious groups to the period of the Danish invasion of the

Holderness coast, between 864 and 7. * * It has been conjectured that the Humber flowed up to near this spot, and the hills in Lorimer's field are supposed to have the appearance of the remains of a haven. In 1802, previously to the formation of the Kayingham drainage, it is stated by a gentleman who knew the locality well, that there could not be less than 6 feet of water above the ground where these figures were found."

MEMOIRS OF MADAME LAFFARGE, WRITTEN BY HERSELF.

[Continued.]

[We continue our account of the life led at Glandier, although our columns are so crowded that we must be more brief than usual.]

I begged M. Laffarge to add a few bottles of wine and some fruit to this heavy and frugal repast, and asked to taste a spoonful of that kind of Spartan broth, which I found excellent, to the great delight of those honest people, who burst into fits of laughter on hearing the compliments I paid their cook. I then got my glass filled at a spring which murmured by, and drinking to their health, as they had done to mine, I promised them, if I was destined to live among them, to take care of them. The enthusiasm of these good iron-workers was unbounded; they emptied their bottles with hurrahs, placed a garland of flowers upon my head, and escorted me in triumph home. I found in the court peasants planting a May-pole, covered with garlands, flowers, and streamers of the national colours; they joined the workmen in welcoming me, fired a few shots, which made the old ruins shake, and began dancing a *bourette* round their tree. I was much amused with the picturesque appearance and the coarse movements of the Limousin dance, with the *naïve* countenance of the musician leaning against a tree, to blow with all his might on a primitive bagpipe, and forgot, for a while, what I had suffered from the contact of this gaity which surrounded me. I re-entered the drawing-room at nightfall; I cast my eyes around me, and the sight of that apartment, so vast and so sad, which would have chilled the least susceptible woman, brought back all my fears; vulgarity threatened to impregnate all one's person, all one's thoughts. The walls were covered with a paper, whose yellow tints were not destined to rejoice the eye, but only to conceal more easily the spots and ravages which time would bring; an alcove ornamented with draperies of red calico, bordered with a yellow cotton fringe, was opposite two windows draped in the same fashion, and a set of drawers, of walnut-tree wood, upon which was spread a carpet rug, quite proud of the new dignity which had raised it from the ground, and which represented the affecting history of two doves swooning with pleasure as they were sinking in a beautiful *lac d'amour*. The chimney was ornamented with five enormous oranges, two fine candles, whose soft white wick attested they had never been used, and a night lamp, where Adam and Eve were proudly intertwined, sinless, but also leafless! We must add to this the loves of beautiful Grecian and a fierce Albanian, the *chef-d'œuvre* of painted paper, much admired by the artists of the neighbourhood; two arm-chairs of red Utrecht velvet, and some straw chairs scattered round the room; there were also two doors of wood and two of glass. M. Laffarge read my feelings in my face; he immediately spoke of improvements, plans, projects. I remained at first inattentive, and silent: then, thinking that to listen was not making any engagement, wishing to be amiable and try and recompense the pleasant day procured me, I endeavoured to take my part in planning. I advised the transforming of the large drawing-room into a bedroom with bath and dressing closets; to turn the entrance passage, which had so untoward an appearance, into an arched gallery, lighted by elegant narrow windows, and paned in black and white squares. To the right, several small rooms could be easily formed into one large dining room; to the left, there should be a study, books, writing implements, and a piano. My mother-in-law listened, stupefied, to these upsetting plans, and seemed to fear I was rather crazy; Mad. Buffière, who wished to approve them, asked "if the young ladies of Paris also learnt to build houses." As for Mad. Pontier she caressed her dog with an ironical smile, and became every day more odious to me. The Pompadour races took place

the next day; they proposed my going, but I was very much fatigued, and did not wish to appear in public leaning on an arm which I had not yet accepted as my protector, and I expressed a wish to remain at Glandier. My decision seemed approved of; my sister-in-law went with one of her cousins, and I insisted on M. Laffarge accompanying them.

During these hours of liberty, my piano arrived from Uzerches. I had it unpacked and placed in the drawing-room, and I experienced one moment of supreme delight as I touched its brilliant and sonorous notes, uninjured by a journey of a hundred leagues. Several persons were expected to call after the races were over; Clementine, very desirous to see me well dressed, and above all admired, made we wear a white muslin dress, fastened my hair with long gold pins, and would place in it a sprig of purple *digitalis*. M. Laffarge was delighted with my toilette; quite proud to present me to his friends, very happy to perceive in my hair his *bouquet* of the morning; and I, affected with his joy and gratitude, permitted him to salute the forehead he had helped to adorn. Every morning after, I always received a *bouquet* of mountain flowers, and made it my dinner ornament. This first evening was gay enough; I endeavoured to make myself agreeable, attentive to his guests; I played quadrilles, pieces, and even the *bourees* that I had heard the evening before. A *déjeuner champêtre* was proposed for the next day, on the banks of the river, not far from Glandier. The weather was fine, though rather stormy, and the guests very gay, with that noisy gaiety which creates wit by dint of foolery, which stuns and painfully saddens those unable to share it. There were no plates: it was necessary to make use of your hands as adroitly as possible; there were very few glasses, but this was an enjoyment discreetly managed; such very pretty commentaries were made upon the thoughts discovered on the edge of the indiscreet crystal which had touched your neighbour's lips before your own. An amiable wit concealed a snail in his lady's *beignet*; another, by *distraction*, drank all the dessert wine: the pleasantries were found very *mal à propos*, and lengthened several faces, even feminine; a third put a tart upon his head; a fourth sang a jovial song. The indispensable accompaniment to the chorus was the shock of glasses and the sound of kissing, which was very successful among some cousins, who laughed under their crepe, and blushed at being obliged to embrace some little cousin of their own age.

My morose countenance chilled M. Laffarge. He proposed my going alone with him to visit one of his buildings, the smoke of which was curling above some chestnut trees, a little way off. I leaped over the rocks and bushes to be sooner away from the scene of noisy mirth, and laughed with M. Laffarge at our desperate flight. Eight days passed thus: in the morning I received some visits; we took long walks and short excursions on the river: in the evening, when not at my piano, I had long, serious, and private conversations with M. Laffarge; I tried to make him partake some of those anti-Limousin ideas, which I thought indispensable for every-day life, and more especially some of those sentiments still more indispensable in that exchange of esteem and affection which should exist in the marriage state. A short time after my arrival I had heard M. Buffière boast of having deceived two poor iron-dealers, by giving to one bad articles, and by concealing from those who trusted to him the true price of iron. I was so much astonished at his being proud of dishonesty, which dared to make a virtue of baseness, that I spoke of it to M. Pontier, telling him that it would be impossible for me to remain mute spectator of such acts, especially to receive at my table poor retailers, whose losses were to enrich me; he approved of this, blamed such conduct, and spoke of it to his nephew. M. Laffarge assured me he disapproved of the conduct of his brother-in-law, that his dishonest practices were in part the cause of their commercial separation; he promised me to have but one price for all, and to be of a scrupulous veracity as to the quality of his iron. M. Pontier, who was his *confidant*, had on his side made M. Laffarge understand that a woman's apartment should be a sanctuary, where she alone reigned; that love could not reign without a veil of modesty; that great delicacy of thought,

words, and actions could alone gain my confidence, my esteem, perhaps my affection. Clementine had taken in hand the reformation of M. Laffarge's dress; knowing my taste, she told him what colours I preferred; made him put on the cravat which would please me; prohibited the waistcoat with glaring colours, which would have appeared to me bad taste. Upon her advice, M. Laffarge shaved every day, paid attention to his hair, his shoes; put on large gloves when he went to the forge, and spared me two calamities, insupportable in private life—slipshod shoes, and nails in mourning, which are, I think, infallible preservatives against love. As for me, in order to please M. Laffarge, I endeavoured to make myself beloved by those whom he loved. I took into my favour his sister's little girl, a fine wild child, of five years old, who was his god-daughter; finally, I got hold of a large *Manuel* for founders, and giving myself up to the study of minerals, divers systems of melting, running, &c., I was soon learned enough to converse with proprietors of forges without being obliged to stop them to explain the technical terms, and talk to myself, with proud assurance, of *poupees*, *gueuses*, *loupes* and *rengends*, &c. Meanwhile, I had not written to my family: I did not wish to make them suffer from my first impressions. I dared not talk of my projects, my resolutions, which fled at the sight of a fine day or a beautiful view, a kind word of love or affection! I waited—accustomed from infancy to bury in my own bosom all my sadness, I have never known the egotistical want of sharing it, the humility of seeking consolation in the pity of a friend. I know how to forget my pains in order to raise the crosses which weigh upon *those of my heart*: but it is in solitude and loneliness that I find strength to carry mine to Calvary.

One evening, having gone to see a *coulée de la fonte*, I felt rather fatigued. M. Laffarge proposed returning by water. It was getting late; a gentle wind blew above the large trees, and waved their flowers above us. At times a grasshopper put forth a noisy song, awakening a colony of austere ants; and a frog, perhaps misunderstood in his tale, uttered a croaking sigh. Then suddenly a sharp vibrating note, interrupted with sighs and songs, and a nightingale commanded silence, in order to warble the blithest note to his adored mistress. All the stars shone out in the heavens, and the moon, looking at her pale divine image in the water, smiled at her beauty. M. Laffarge pulled a few feeble strokes with the oar, then dropped it. He encircled me with one arm, for I was leaning over the side, with my hand in the refreshing liquid, watching the flow of the little river without a ruffle. A beautiful water-lily was floating before us; I made a sudden movement to seize it, and M. Laffarge uttered a cry of horror.—"Ah!" said I, laughing, "I am sure you thought I was going to commit suicide. Reassure yourself, reason has returned; and my imagination, at times rather silly, is never sovereign *woman and despot*, but for a few moments."—"You will not leave us, then?"—"Why, that depends upon you."—You know, Marie, that all my desire is to obey and please you."—Promise me, then, to treat me, and consider me, for the present, as your sister. You are silent! Come, accept my plan, you shall see what an amiable sister I shall be."* * "I accept everything you wish, little original, for I love you to madness. Do you love me at all?"—Not yet, but I feel that it will come, with God's assistance, and especially with yours."* * The day after that in which I had accepted my new duties, I ran over with a more indulgent eye my poor ruined château. I had a thousand plans and projects for its embellishment: then wrote to all I loved, more especially my aunt Garat, whom I asked for the most needful things which were wanting:—a man-servant, wax candles, and other little means, to render my little kingdom more supportable.

OUR LIBRARY TABLE.

Isidora, or the Adventures of a Neapolitan, by "The old author in a New Walk," 3 vols.— Ere the "Old Author" for a second time starts forth on "the new walk" of romance, he indulges himself in a prefatory frisk, which, compared with the genuine sprightliness seasonable in a prologue, is what the dancing of the fabulous Countess of Desmond, at the age of one hundred and twenty, must have been, if measured against the fresher graces of an *Elssier* or

* We do in that too much the candle had two Hereupon movement of things."

a Cerito. Such antiquated nimbleness is anything rather than engaging; and 'Isidora' has sufficient points of "grace and pleasure" to have dispensed with any Merry-Andrew tricks, by way of introduction. What splendid names does the modern history of Italy yield to the artist! And the "old author" has dexterously interwoven many of these august and brilliant personages—Andrea Doria—Masaniello—Barbarossa—Ariosto—Bembo—Vittoria Colonna—into a tolerably exciting romance, beginning with a bull-fight, and ending with a piratical abduction of the heroine, and its sequel. The heroine is almost as beautiful, and almost as lasciviously described, as though she were the Pampinea or Fiammetta of one of the genuine old *novelle*; and the hero bears the gallant name of Procida. There is a Sancho Panza provided for this pink of chivalry in Bernardo Accorto, his servant—as very a knave as ever novelist delighted to draw; and there is a guardian spirit, of course, to watch over true love and to denounce villainy, in the stalwart, mysterious hermit of Caprea. Our readers will perceive that the "old author" has wrought according to approved pattern.

Lives of the Eminent Men of Aberdeen, by James Bruce.—This is an amusing volume, though full of prejudices and faults. Mr. Bruce seems to have fancied that besides the lives of the natives of Aberdeen, his townsmen and other readers must be anxious to possess his views of men and matters in general; and accordingly, he loses no opportunity of dogmatizing concerning life and literature; sometimes shrewdly, but always with an assumption of authority not a little ludicrous. This grave fault allowed for, his choice of subjects is good, his execution careful, and his little volume is welcome as a contribution to the provincial history of Great Britain.

Lectures on Colonization and Colonies, by H. Merivale, A.M., Professor of Political Economy.—In these lectures Professor Merivale investigates the origin and growth of the principal European Colonies; the economical effects of colonization on the parent state, and the progress of wealth and society in the colonies themselves.

Difficulties of Elementary Geometry, by T. W. Newman, formerly Fellow of Balliol College, Oxford.—If we were to write upon this book every thought which its pages might suggest, our journal would die of a fit of geometry. In earnest, we should consider him a very stupid specimen of a mathematician, who could not find much to say in support or refutation of most of its pages; and most of our scientific readers would say, we should consider him in much the same light who could write upon the difficulties of geometry, without deserving that the above should be said of his book. The work before us is one of decided talent, of excellent freedom of thought, and of valuable suggestion; but its subject is one which, of necessity, cannot command anything like general agreement; one reason of which may be, that so few persons of Mr. Newman's qualifications have turned their attention to the points which it discusses, so as to produce a systematic treatise upon them. We need hardly tell the geometer what sort of matter Mr. Newman discusses. His object seems to be, to mislead and discuss every doubt. He would not, he says (p. 66), willingly assume the possibility of the existence of the science of geometry. "If a stiff objector protest that, for anything which has yet been proved to him, geometry cannot, in the nature of things, become a science of calculation, it may be very hard to answer him." Now the fact is, that these "stiff objectors," when they do really appear, are commonly anything but stiff in their arguments, whatever they may be in their necks: so that unless a person of qualities superior to their own personates them, and makes their case stronger than they can do it for themselves, they do not get a fair hearing. The best thing a man could do who wanted to declaim against lawyers, would be to instruct counsel, and remain silent. We have, too, some kind of respect for the "nature of things," at least we should not go the lengths which Porson* is said to have done

against it. But if any one should really use the sort of argument which Mr. Newman would find it hard to answer, we should beg to step in to his assistance. — "Will you begin with us to reason on such truths as that the whole is greater than its part, and that two straight lines cannot enclose a space?"—"No, for I see, from the nature of things, that no science can spring out of such reasonings."—"Very well, you have a right to *à priori* assertions, from the nature of things, and so have we; our things may have a nature, as well as yours: we deny your existence."—"Deny my existence when you can see and handle me, and hear my voice?"—"Your limbs indeed, and your voice! do you expect us to draw any conclusions from such things as those, when we are to give up inferring from conceptions that we feel would remain in our minds, though touch, sight, and hearing were to cease? We are not the fools you take us for. Consider yourself annihilated."

Tables of Logarithms, by E. Riddle.—These are the six-figure logarithms in Mr. Riddle's well-known work on Navigation, published separately, from the revised stereotype.

Yarrell's History of British Birds, Nos. 22—25, completing the second volume.—The Parts before us are devoted to the wading birds, so many of which are objects of interest and pursuit to the sportsman, to whom, indeed, the work will be almost as acceptable as to the ornithologist, abounding as it does with sporting anecdotes. A beautiful vignette represents two woodcocks lying dead. These birds were killed by Sir Francis Chantrey, at Holkham, in November 1830, at one shot. "To record this event, (says Mr. Yarrell,) Sir Francis sculptured two woodcocks on a marble tablet, which he presented to Mr. Coke, now Earl of Leicester. The occurrence, from its singularity, has been the subject of many epigrams and complimentary verses; the following couplet was written by Hudson Gurney, Esq.—

Chantrey from northern climes that would have starved them,

that is, in marble.—The delicacy of the engravings is beyond praise.

Manual of British Ornithology, by William Macgillivray, Part I, the Land Birds.—A work containing descriptions sufficient to enable the student to determine species, and of a portable size, might have been practicable by throwing all the birds, land and water, into a volume: but in the work before us, each species on the average occupies somewhat more than a page, so that the information given is more than sufficient for the mere purpose of recognition, and not enough for details of habit, &c. The distribution of the land-birds alone into twelve orders, without any primary division, argues, we think, a want of generalization, so necessary in a natural history writer; nor do we see the necessity for, or advantage of, the change of nomenclature which has been introduced.

A History of British Starfishes and other Echinoderata, by Edward Forbes.—We are well pleased to see the completion of this very interesting work, the subjects of which are so little known. Parts 4 to 6 are occupied with the sea urchins, sea cucumbers, and some other allied animals; and as a proof of the value of the work, it may be observed that many of the species are now for the first time described—each being illustrated with one or more beautiful woodcuts.

College Entrance and School Virgil.—The editors of these selections from Virgil have condensed their notes from the most approved commentators, but in many places their brevity has led them into obscurity.

Dives and Lazarus, with other Poems chiefly sacred, by Benjamin Stabler.—Sacred Burlesques would be a more fitting title for this volume, whose only excuse is that its irreverence is unintentional, and whose sole merit consists in its brevity.

Houston's Scrap Book: or Literary Miscellany of Rational Recreation.—Some of the scraps here gathered up are of a threadbare familiarity, some of a material hardly worth including in a collection, into which, however pressing be the call for variety, no trumpery should be admitted. The book is rather well meant than well done.

List of New Books.—Hornpus's Tables for Measuring, or Practical Measuring made Easy, new edit. 12mo. 4s. fid.—Jahr's Manual of Homoeopathic Medicine, translated from 3rd Paris edition, by Dr. Laurie, 2 vols. post 8vo. 28s. cl., or Vol. II. separately, 8vo. 15s. cl.—Mary and Florence, or Gravé and Gay, new edit. 12mo. 5s. cl.—Ventouillac's (L.T.)

Livre de Classe, new edit. fe. 5s. cl.—Westminster Full Book of June, 1841, 8vo. 6s. bds.—Wedlock, or Yesterday and To-day, by the Author of 'The Maid's Husband,' 3 vols. 31s. 6d. bds.—Cream of Scientific Knowledge, 18mo. 3s. cl.—The Post Captain, or the Wooden Walls well Manned, new edit. royal 32mo. 2s. 6d. cl.—Alison's Europe during the Revolution, Vol. IX, 8vo. 15s. bds.—Wartes's Death-Bed Scenes, Vol. IV, 8vo. 12s., or 18mo. 6s. bds.—Bishop Prideaux's Doctrine of Prayer, edited by the Rev. Dr. Cornish, 18mo. 4s. cl.—Gideon, the Mighty Man of Valour, new edit. fe. 7s. cl.—Haughton (the Rev. G. D.) on Sex in the World to Come, crown 8vo. 7s. 6d. cl.—The Works of the Rev. Daniel Isaac, by John Burdall, 3 vols. crown 8vo. 19s. 6d. cl.—Memoir of Mrs. W. W. Duncan, by her Mother, fe. 4s. 6d. cl.—The Last Days of the Martyrs, by Andrew Bonar, 18mo. 3s. 6d. cl.

WHAT HATH TIME TAKEN AND LEFT.

WHAT hath Time taken? stars that shone

On the early years of earth,

And the ancient hills they looked upon,

Where a thousand streams had birth;

Forests that were the young world's dower,

With their long unfading trees;

And the halls of wealth and the thrones of power—

He hath taken more than these:—

He hath taken away the heart of youth,

And its gladness, which hath been

Like the summer's sunshine o'er our path,

Waking the desert green.

The shrines of our early hope and love—

And the flowers of every clime—

The wise, the beautiful, the brave,

Thou hast taken from us, Time.

What hath Time left us? desolate

Cities and temples lone,

And the mighty works of genius, yet

Glorious when all are gone;

And the lights of memory lingering long,

As the eve on western seas—

Treasures of science, thought and song—

He hath left us more than these:

He hath left us a lesson of the past,

In the shades of perished years—

He hath left us the heart's high places waste,

And its rainbows fall'n in tears.

But there's hope for the earth and her children still
Unwithered by woe or crime,
And a heritage of rest for all—

Thou hast left us these, O Time!

F. B.

EDWARD ALLEYN, FOUNDER OF DULWICH COLLEGE.

Antiquarian researches, especially those of a literary kind, are very inviting and animating, because we never seem to come to the end of them. It is always a matter of speculation, something in the nature of gambling, whether what is entirely new and unknown, and at the same time highly interesting, may not turn up, and sooner or later reward the toils of the zealous and industrious grubber, among "the dusty relics of a by-gone day." His faculties (such as they are) are always kept on the alert: his imagination (if he have any) is always at work, and his expectations constantly and eagerly awake.

After I had composed the "Memoirs of Edward Alleyn," (not long since printed by "The Shakespeare Society,") [Athen. No. 696] I paid a fresh visit to Dulwich College, thinking it possible I might still discover among the papers and deeds belonging to that Institution some particulars respecting the personal history of the founder, which were new, or which, if not new, I had passed over without due attention. I had been long in search of a Memorandum book, kept by Alleyn (according to Malone) in his own handwriting, from which had been quoted some information respecting the building of the Fortune Playhouse. This record I could never find, but I was the less anxious about it, because I imagined that Malone would have copied from it all that was of any value. On my final hunt over the documents "in the Treasury Chest of God's Gift College," I was lucky enough to meet with it in a sort of side drawer or recess, and I was moreover happy to find that it contained some minute intelligence respecting events and circumstances, which I had either not mentioned at all in my "Memoir," or which I had been obliged to dismiss very hastily and unsatisfactorily. Some missing dates are thus ascertained upon evidence that cannot be controverted, for the whole is the autograph of Alleyn, and it extends over

* We do not vouch for the story; it is as follows:—Being in that state, which, in the nature of things, follows from too much strong drink, he made several attempts to grasp the candle which was to light him to his bed: but the candle had two images, and he always fingered the wrong one. Hereupon he is said to have exclaimed, to the great amusement of those who were looking on, "—the nature of things!"

a period from 1594 to 1614. It was probably kept by him until he commenced the system of a daily Journal of incidents and payments. From this last I have made ample extracts in the work to which I have alluded, and from the memorandum-book I am now about to furnish some items, which will confirm or correct points adverted to by me in Alleyn's biography. I shall take them in the order in which they present themselves in the original.

It appears, first, that Alleyn became part proprietor of the place for baiting bears, bulls, horses, &c. called Paris Garden, in December 1594; that his share cost him 450*l.*, that he let it for 16 years at an annual rent of 60*l.*, and that in February 1610 he sold it to Philip Henslowe for 580*l.* Thus, besides receiving 960*l.* in rent, at the end of 16 years he obtained 130*l.* by his bargain. The matter is thus stated by Alleyn himself, in his memorandum-book, which is a small thick octavo volume of some 600 pages, most of which are not written upon:

What the Bear-garden cost for mine own part in Dec. 1594:
First to Mr. Barnabye £200
Then for the patent 250

Sum is 450

I held it 16 year, and received 60*l.* per annum. which is 960
Sold it to my Father Henslowe in Feb. 1610 for 580*l.*

I forbear to give these entries in Alleyn's irregular orthography, because I think nothing is gained in a case of this kind by such literal exactness. I have said in the 'Memoirs,' p. 17, that Alleyn and Henslowe "entered into partnership in theatrical concerns" in 1592; but from what precedes we learn that they were not jointly engaged in the Paris Garden speculation, at all events, until the end of 1594, or the beginning of 1595.

The next incident we come to relates to the parsonage of Firle, in Sussex, in which it is clear that Alleyn once had the property, although even the memorandum-book under consideration does not make it clear when he acquired it. In the 'Memoirs,' p. 37, is inserted the sketch of an agreement for the sale of Firle to Arthur Langworth for 3,000*l.*, to be paid in 20 years: this bears date in 1596, but from the memorandum-book we learn that Alleyn had originally (the date is not given, but it must of course have been prior to 1596,) purchased the parsonage from Langworth. The entries there found run as follow:

What the Parsonage of Firle cost me (in all) of ready money, or other ways

£. s. d.

First to Mr. Langworth.	1066	13	4
Three years forbearance: the last payment lost, which he should have paid	66	13	4
I gave him at last parting	70	0	0
With two bonds of	30	0	0
My charges for conveyances and law	10	0	0
Which is in all, without allowance for three years forbearance	1273	6	8
So in all it cost	1323	6	8

This sum of 1,323*l. 6s. 8d.* was the price Alleyn paid for it to Langworth prior to 1596. The preceding account is followed by a statement of Alleyn's receipts from the Parsonage while he held it:

What I received of it

£. s. d.

Five payments from Arthur Langworth, 100 marks: a payment half-yearly	333	6	8
For one year's crop to Page	100	0	0
For four years' of Mr. Roots	440	0	0

Sum 873 6 8

Sold this Parsonage to Mr. Homden and Mr.

Bunce about Christ. 1605 for £1300 0 0

Thus we see that Alleyn kept the Parsonage of Firle until 1605, when he disposed of it at a loss of only 23*l. 6s. 8d.*, and had received from it, while in his possession, the sum of 873*l. 6s. 8d.* It follows that the agreement for the re-sale to Arthur Langworth, in 1596, was never carried into execution, and that Alleyn retained the property for nine years afterwards. Farther on in the memorandum-book

* In another part of the memorandum-book we meet with an enumeration of "the writings of the Bear Garden," whence we learn how it came into the hands of Alleyn, who soon afterwards admitted Henslowe to a share. Among the writings are these:

Ballard's lease to Pope.

Morgan Pope to Edward Bowes.

Ralph Bowes and Edward Bowes to Morgan Pope.

Ralph Bowes and Edward Bowes to Burnable.

Burnable to Edward Alleyn.

Edward Alleyn to Philip Henslowe.

Jacob Meade's lease.

Thus Ballard let Paris Garden to Pope, Pope to E. Bowes, R. Bowes and E. Bowes again to Pope, R. Bowes and E. Bowes to Burnable, Burnable to Alleyn, Alleyn to Henslowe, and finally Alleyn and Henslowe to Meade.

we meet with some notes thus headed—"The Writings of Firle," and these notes show how the property came to Langworth, through the Sackville family; they are these:—

"The Church-lease to Mathew Marsh and Peter Marsh for 250 years.

A conveyance from Peter Marsh and Mathew to Mr. Wattes, Alderman.

From Chapman to Wattes.

From Earl to Wattes.

From Wattes to Buckhurst.

From Lord Buckhurst to his son.

From Mr. Ro. Sackville to A. Langworth.

From A. Langworth to E. Alleyn.

From E. Alleyn to Jo. Langworth.

From Jo. Langworth to E. Alleyn.

A Release from A. Langworth.

Two bonds of 2,000*l.*

Richard Earl's letter of attorney to Chapman."

The Lord Buckhurst mentioned above was, of course, no other than the author of the *Induction to the Mirror for Magistrates*, and the joint writer, with Thomas Norton, of the celebrated tragedy 'Ferrex and Porrex,' acted before Queen Elizabeth in 1561.

Some memoranda relating to the Fortune Playhouse were procured, as has been stated, by Malone from this source, and from his work I transferred them into my 'History of English Dramatic Poetry from the Stage,' vol. iii. p. 309. The authority before us does not enable us to determine whether the 1,320*l.* expended by Alleyn upon the Fortune, was for his sole share of the theatre, or the entire cost of the building, in which Henslowe was Alleyn's partner: we learn however from it, that Alleyn bought the inheritance of the ground on which it stood on the 30th of May, 1610, the playhouse itself having been built ten years earlier. A list of "evidences," forty in number, is appended to this memorandum, but it is needless to detail them, as they throw no new light upon any part of the transaction.

In the 'Memoirs of Edward Alleyn,' p. 143, I say that he had "exchanged some property at Kennington with Sir Francis Calton in completing the bargain for Dulwich." This is all I then knew of the matter; but from Alleyn's Memorandum-book I have since learned the important fact in his history, that as early as 1604, some time, I apprehend, before he quitted the stage, he had become lord of the manor of Kennington, for which he gave 1,065*l.*, and which he disposed of to Sir Francis Calton five years afterwards for 2,000*l.*, thereby making a clear profit of nearly 1,000*l.* In speaking of these sums, let it be recollect that 1,000*l.* then was equal to nearly 5,000*l.* now. No wonder, therefore, that Alleyn's wealth increased rapidly, and that, in his own words, "God blessed it with him." The items referring to Kennington are entitled—

What the Manor of Kennington cost me, Novemb. 1604.

First to Mr. Skevington, for the lease in possession	£660
Then to Tho. Webber, for the lease being in reversion	405

Sum in all 1065

Sold this Manor of Kennington to Sir Fr. Calton, knight, the 1st of Septemb. 1609 for £2000

This fixes the date of Alleyn's letter to Calton ('Memoirs,' p. 143,) posterior to September 1609, for there the sale of Kennington is referred to.

From the same curious relic, (which, as has been observed, is wholly written by Alleyn,) we are able to ascertain the year when he became lord of the manor of Dulwich, and to trace the gradual acquisition of property there by the founder of "God's Gift College." Had I seen it before I completed the compilation of the materials for the 'Memoirs of Alleyn,' I should not, of course, there have said (p. 82) that "nobody has been able to fix the time when Alleyn first began to acquire property in Dulwich." I now have before me every date of every purchase, with the price paid, and name of each person to whom it was given. Some of these purchases are cursorily noticed in the volume printed for the members of the Shakespeare Society, but not with the same distinctness and certainty with which I am now able to speak of them.

Alleyn bought "the lordship of Dulwich" of Sir Francis Calton, in 1605, for 5,000*l.*, of which he paid 2,000*l.* down, leaving 3,000*l.* as it were upon mortgage, and paying 213*l. 6s. 8d.* per annum "for forbearance," or, in other words, for interest: he did not complete the purchase, by paying the last instal-

ment of the 3,000*l.*, until the 25th of October, 1613. These facts are thus registered by Alleyn:—

In no[mine] do[min] Amen. Anno 1605.

Bought the Lordship of Dulwich of Sir Francis Calton, knight, this 20th October for £.

Whereof 2000*l.* paid in hand, the other 3000*l.*

at the end of six years, with consideration £. s. d.

yearly for forbearance of the 3000*l.*, the sum of 213 6 8

Paid Sir Fr. the said sum of 3000*l.* at several pay-

ments, and the last on the 25th of October, 1613.

From the "evidences," a list of which follows the above memorandum, it appears that the ancestor of Sir Francis Calton obtained a grant of the manor from Henry VIII., at the dissolution of the monasteries, and that the property had at one time been mortgaged to Sir Robert Lee, Lord Mayor of London.

From this date Alleyn seems to have set himself to buy up the separate property of individuals, whether copyhold or otherwise, within the manor of Dulwich. On the 1st of June, 1606, he purchased a house and five acres of land of Thomas Emerson, for 230*l.*; and on the 3rd of July following, he became owner of "Hethersall's house," and thirty-two acres of land, for which he paid Thomas Calton 300*l.* On the 16th of October, 1606, he bought "Berry's house and land" (thirteen acres), for 231*l.*; and in the next month he paid 92*l.* for a tenement and nine acres of land, which had been occupied by John Ewin, and 231*l. 13s. 4d.* for Thomas Turner's house and thirteen acres of land. On the 1st of June, 1607, he acquired "the corner house in Dulwich," and sixteen acres of land, by purchase from Thomas Calton and his wife, and Henry Farr and his wife, but the sum he paid for it is not stated. On the 22nd of October of the same year he gave 400*l.* to Ellis Parry, "for all his lands in Dulwich;" and in the same month of the year following (1608), he gave 50*l.* to Thomas Calton, for some interest he had in "Little Brownings" and "Carter's Garden." On the 13th of December, 1608, he made a very important purchase of "all Sir Edward Bowyer's lands," &c. in Dulwich, consisting of "about seventy acres, and eight or nine houses," for 1,650*l.* Alleyn here paused, and did not make any fresh additions to his estate, until the 25th of November, 1611, when he paid 510*l.* to Thomas Calton, for Carter's Hall, Great Brownings, and Addington's Meadows, containing in the whole twenty-six acres. On the 2nd of November, 1613, he gave 160*l.* to Sir E. Duke, for seventeen acres of land, and on the 1st of June, 1614, two persons of the name of Shillingford received from him 16*l.* for their share of "the Blue House" in Dulwich.

Hence we see that, including the original purchase of the lordship from Sir F. Calton, Alleyn gave no less a sum than 8,870*l.* for his estate in Dulwich before he built his College there: supposing he paid a fair price for the houses and land, his property in Dulwich alone would be worth not far from 45,000*l.* at the present value of money.

But this was by no means the whole of his possessions, as we find upon the same conclusive evidence, and putting out of view his large pecuniary interest as sole owner of the Fortune Theatre, his houses in the Blackfriars (including probably the playhouse), and Paris Garden, which wholly devolved into his hands after the death of Henslowe. Besides these, he had valuable houses and ground in Southwark, including that on which the Rose Theatre either stood or had stood, a "wharf in the Close," as Alleyn calls it, and leasehold property held under Lord Montague. The memorandum-book also includes a list of "the deeds of my houses in Bishopgate Street," which he had derived from his father. We know also, that he was the owner of dwellings and land in Lambeth Marsh, though the authority to which we are now indebted is silent regarding them; but it contains one notice of which we find no other trace, viz. that at one time (no date is inserted) Alleyn was owner of a tavern called "The Boar's Head." No doubt it was a common sign, and it might be the inn in Bishopsgate, which his father had kept; but the very name carries us, with a sort of magical attraction, to Shakespeare and his plays.

On the whole, I should be disposed to value Alleyn's property, at the period when he commenced Dulwich College, at not far short of 100,000*l.* of our present money. Nor is this matter without interest in reference to Shakespeare. If Alleyn could acquire

so much between about the years 1590 and 1614, it is not very unfair to presume that our great dramatist was also a comparatively wealthy man at the time he quitted London for Stratford-upon-Avon.

J. PAYNE COLLIER.

FOREIGN CORRESPONDENCE.

August.

On the road from the romantic town of Auxerre, whose antique cathedral, placed on a commanding height, looks far over the surrounding country, leading to Dijon, lies, among circling hills, the town of Tonnerre, on the pretty river Armançon, which here joins the great canal of Burgundy. The vintages which these coteaux produce, are some of the best, and their fame stands very high, not being distant more than a few leagues from the renowned Chablis, and vying with those vines in excellency. A pretty drive of two leagues over a good road, but up very steep hills, brings the traveller to the beautiful and secluded chateau of Tanlay, one of the few really fine habitations of the nobility in France, and which possesses great interest with Protestant Englishmen, from its association with the illustrious and unfortunate family of Coligny, to whom this estate belonged in 1535. In the 13th century a fortress was constructed here, by one of the sons of Louis le Gros. This fortress, swelling into a castle, was long occupied by the illustrious family of Courtenay, part of which race were possessors of the throne of Constantinople. The importance of Tanlay was very great in the 15th century: Charles le Téméraire looked upon it as one of the most consequence in Burgundy, and thought it worth his while to bribe the chelain Aymé, to keep it friendly to his cause. A female of the house of Montmorency inherited the possessions of the Courtenays, and brought this chateau, then dilapidated with frequent sieges, into the family of Coligny. D'Andelot, the younger brother of the Cardinal Odet de Châtillon, and the Admiral, had it for his portion; but the friendship which subsisted between the brothers made the inheritance as much the residence of one as the other. The antique walls furnished materials to rebuild the castle in the style of la Renaissance; but the original foundations, too strong to be removed, necessitated a degree of irregularity, which the taste of the time would have avoided. In the midst of his new constructions, François d'Andelot was arrested by the religious wars, which allowed but little peaceable employment, and the large sum of money requisite to continue his plans were obliged to be devoted to other purposes. Much, however, of the present magnificent building was constructed under the direction of the brothers; and the tower, since called *De la Ligue*, offers many reminiscences of their time. One of the principal is a splendid chimney-piece, entirely uninjured, representing admirably carved, the head of the Admiral covered with a plumed casque, with two sphinxes reposing on each side: the whole is in a delicately-tinted yellow marble, and for boldness and grandeur is unrivalled, except by a similar piece of carving in a chamber adjoining, which is perhaps even more exquisitely executed. The apartment, however, which is the most singular, is on the second story of the *Tour de la Ligue*, and deserves particular mention from the inexplicable peculiarities attached to it. It is a circular room, lighted by five windows, each having a deep embrasure, large enough to form a small cabinet, from whence an agreeable view of the circling hills may be obtained. This is said to have been the favourite retreat of the Prince de Condé, the Colignis, and their Protestant friends; but it must have been rather for the purposes of entertainment than serious business that they assembled, for it would appear to be rather an abode of gaiety and festivity than solemn consultation. All that now remains of the adornment of the place, are the singular frescoes which appear on the vaulted ceiling, painted in high style of art, but whether traced with a view to convey a compliment or a satire, it is difficult now to decide. The scene represented is Olympus, and the deities wear the well-known features of the too famous Queen-mother Catherine, and her renowned *Bande de beautés*, accompanied by the chiefs of the party of Navarre. The Prince of Condé appears as Mars, and near him stands Venus, evidently a portrait, but one of the least pleasing as to face: the figure is very fine; the Conseiller de Birague, as

Vulcan, looks furtively at the pair; a group of nymphs surround the Queen, amongst whom is conspicuous Madle. de Rouet, whose fatal charms drew the weak Prince Anthony of Navarre from his allegiance to his party and his noble-minded wife. He stands behind her almost concealed. There is much beauty in the disposition of these groups of females; but the total absence of drapery, and the evidence of their being portraits taken from the life, gives rather an unpleasing as well as constrained air, to some of the figures, which are nevertheless admirably painted, and in general well drawn. The Juno of the party, the Minerva, and Urania, alone appear covered with flowing robes; and these represent Marguerite de Valois as the Muse, Catherine as the Queen of all, and who the third may be is doubtful—perhaps the modest Elizabeth, wife of Charles IX., or more likely Claude de France. Marguerite is young and beautiful—"belle et bien avisée, et de bonne grâce," as was described by Jeanne of Navarre to her son; but Catherine is the problem of the piece, for she is represented with two faces—one calm, dignified, yet soft, with a sweetness of expression very remarkable, and a benign character sufficiently at variance with that which the back of the head offers: it is masculine, coarse, malignant, and so well expressed, that it is easy to behold in its sinister scowl, hatred, perfidy, and cruelty—it is appalling in its truth, and, though partially in shade, is brought out with wonderful force, which makes it conspicuous in the second glance, the first serving only to take in the pleasing aspect of this remarkable figure. Charles IX. stands near his mother, handsome, bold, and spirited—his emblems are those of Pluto; and here begins another mystery, which the unfortunate desire of some later proprietor to clean the walls renders impenetrable, for all the rest of the allegory is a confused mass of colour: tradition says, that the infernal regions opened at the feet of these deities, and numerous portraits were amongst the inhabitants of these abodes of darkness.

Strange allegories were often, at this period, produced both in painting and acting,—witness the play performed by the King and his brothers and friends, on the eve of the Massacre of St. Bartholomew; but the clue to this is gone, and conjecture alone is left as to the meaning. The colours are bright, and fresh, and the hand of a master is distinguishable in the touches: it is to be regretted that the style in which the subject is treated, renders it too disagreeable to be generally exhibited; and in consequence, and from an averseness in the present possessor to destroy so singular a production, this beautiful chamber is left in a neglected state. A temporary ceiling of cloth might be easily placed over the offending pictures, and the charming pavilion fitted up with books and ornaments of modern taste, as is the case with the pretty towers at Chenonceau, which delightful abode Tanlay resembles in many particulars. The other parts of the chateau are accommodated with everything that can be wished for a comfortable dwelling-house; the choice of the furniture and decorations is in the best possible style—nothing gaudy, and no crowding—all simple, rich, and grand. Occasionally a fine vase and a piece of porcelain ornamented by the hand of Palizzi, attracts the eye, and some excellent family portraits give additional value to the collection.

But to return to the three brothers: in the intervals of the desolating civil wars, the Cardinal, whose purse was more amply filled than those of the others, advanced to François large sums, to enable him to go on with their favourite chateau, and it advanced by degrees towards its completion. The proximity of Noyers, which belonged to the Prince of Condé, caused Tanlay to be the frequent rendezvous of the Protestant chiefs; there is even a current tradition, that a subterranean way existed from one castle to the other, of which, however, there is no means of ascertaining the truth. Another tradition, more likely to be founded in fact, is attached to a vineyard, which is pointed out on one of the coteaux to the north-east of the chateau, as that in which D'Andelot and the Admiral concealed themselves, disguised as peasants, with their mattocks in their hands. The occasion was this. Shortly before the peace concluded, on the 2nd of March, 1568, the Admiral and his brother were advised of the orders transmitted by the Queen-mother to Marshal Tavannes, to surprise them and

the Prince of Condé, who was then at Noyers. Tavannes, however, disapproving of this plan, was himself the means of saving the Protestant princes; for instead of causing the two thousand troops under his command to advance, he arrested their march, and sent almost under the very glacis of Noyers messengers, who bore about them letters containing these words:—"Le cerf est dans les toiles, la chasse est préparée." These messengers were, as Tavannes had expected, taken prisoners, and the Prince and the Admiral, who was also at Noyers, warned in time. He immediately returned by a private way to his brother at Tanlay. They made hasty preparations to quit Burgundy, when never alarm obliged them to leave their castle in the disguise already mentioned. The next day they joined Condé, and with other gentlemen of the party escaped to their friends on the banks of the Loire. War was now renewed with redoubled fury, and the three brothers separated; the Cardinal took refuge in England, where he soon after perished, not without suspicion of poison administered by the emissaries of Catherine. The Great Condé fell at Jarnac, after performing miracles of valour. D'Andelot died at Saintes, the 27th of May, 1569, poisoned by the same unerring hand, verifying what the Chancellor Birague had said, the war "would finish not by means of arms, but cooks." The Admiral, now alone, returned but once to Tanlay after his brother's death. His subsequent fate is well known, but perhaps the circumstances of his second marriage are less so. Coligny was sixty-two when a young and beautiful woman of high birth became devotedly attached to him, whom she looked upon as the greatest hero of the age. Her name was Jacqueline de Montbel, Countess d'Entremonts, widow of the Count du Bouchage, killed at the battle of St. Denis, in 1567. The Admiral lost his wife the same year. Finding that he was free as well as herself, she offered him her hand immediately after the conclusion of the peace in 1570. No consideration could oppose her design: her relation, the Due de Savoie, violently opposed this marriage, and confiscated in consequence her immense fortune. Careless of all, she escaped from Turin, proud, as she expressed herself, of being the Maree of this second Cato. Their union was celebrated the 21st of March, 1571, only seventeen months before the cruel fate which overtook him so much loved. She was at Châtillon when the hideous events of the Matines de Paris occurred; for, with all his confidence in the good faith of the Court, the Admiral had entreated her to stay behind.

D'Andelot's sons had both fallen in battle, and Tanlay was the inheritance of his daughter Anne, who married the Marquis de Mirabeau. He it was who built the unique *petit chateau* which exists at the entrance of the great building.

This is, perhaps, one of the most beautiful specimens of art in the sixteenth century, and presents all the graces which characterized the Renaissance. The sculptures are exquisite, the friezes and pilasters extremely graceful, and every part finished with inimitable taste. The daughter of Mirabeau brought Tanlay as a dower to her husband, by whom it was at length sold to Michel Particelli, seigneur d'Hémery, in 1642.

Michel Particelli was of obscure origin, but became sufficiently known as Controller-General of Finance under the ministry of Louis XIV. He was, in fact, the precursor of Fouquet, and in many respects his model. Previously employed by Louis XIII. as treasurer of the King's plate, his probity had with much apparent cause been suspected, and his conduct was more than doubted in the affair of the *trousseau* of Henrietta of France, Queen of England. He was, however, not to be daunted; and, in spite of his defeat when he sought the position of Maitre des Comptes, he contrived to become Secretary of Council, where his intelligence and quickness, and, above all, the extraordinary faculty he possessed in the memory of numbers, stood him in good stead. Cardinal Richelieu was the first to perceive the real capacity of Hémery, and to place it to its right use. He unhesitatingly named him as Intendant of the Army in the war for the succession of the Duchy of Mantua. To this place was attached a purely diplomatic mission, that of gaining over the Duke of Savoy from the alliance he had formed with Austria, in favour of Charles de Gonzaga, legitimate heir of the Duchy.

This scheme failed; but the Cardinal, notwithstanding the price he set upon its success, could not but acknowledge the activity, zeal, and dexterity with which Hémery had fulfilled his office; and as a mark of his satisfaction, he left him, after the peace, as ambassador of France at Turin. He was also Intendant of Finance. The marriage contracted by Hémery, long before he had risen to these important employments, proves that his rank was considered of some consequence. His wife was Marie le Camus, daughter of a chancellor of state and Marie Colbert. In 1643 the regency of Anne of Austria began; Mazarin was at the head of affairs; the financial condition of the kingdom was deplorable. The President Bailleul, to whom the Queen had confided the superintendence, not because of his talents, but that he was a mere creature devoted to her will, found himself unable to meet the exigencies arising from the maintenance of three armies—in Italy, in Catalonia, and in Alsace. Mazarine, therefore, judged it advisable to cover the nullity of Bailleul, by giving him an intelligent adjunct: he chose Hémery, as a man full of expedients and fertile in fiscal inventions. And in 1646, when Bailleul retired, Hémery assumed his place; but from that time he had to support a constant opposition to the measures he proposed to raise taxes, in a manner as covert as possible, in proportion as the destitution of government became more and more apparent. In all his struggles he was supported by Mazarin, until, when that minister found that his nefarious projects and inhuman measures had raised a cry against him, which no subterfuges could turn away, his timidity got the better of his bold intentions, and he saw no way of escape but by sacrificing Hémery, who was sent into retirement by his country residence at Tanlay. He was, it is true, afterwards recalled, but only to be again replaced; and from that time he did not quit his domain till his death in 1654.

Whether Hémery were more or less culpable, and how he acquired his enormous fortune, is not, however, here the question—he has left the mark of his golden hand on his residence of Tanlay, and thus deserves, if not an honourable one, at least some mention. The arts, at least, owe him some distinction, for of them he was a liberal encourager; he acted according to the advice of Voltaire, who says—

Le riche est né pour beaucoup dépenser.

It was between the years 1643 and 1648, that Hémery completed, not only the great chateau begun by d'Andelot, but added the vast buildings attached to it, which made it one of the most magnificent habitations in France at the period, for there were few of the kind, in the time which preceded the long and splendid reign of Louis XIV., when they became as universal as they were gorgeous. Hémery confided to Le Muet, the most celebrated architect of his time, the task of realizing his vast projects of construction. Le Muet, besides Tanlay, has left several remarkable edifices of his building; amongst others, those of Chavigny in Touraine, and Pont in Champagne, which latter was once possessed by Madame, mother of the Emperor, and till lately, belonged to the family of M. Casimir Perier. Anne of Austria chose Muet to finish Val de Grace, left unfinished by Mansard, and he erected several distinguished hotels in Paris.

Nothing can surpass the magnificence with which he has adorned Tanlay, its porticos, pillars, courts, arcades—the sculptures and forms of all are delicate and grand in the extreme, and the famous Château d'Eau, at the extremity of the grand canal, which is of extraordinary length, is both magnificent and beautiful. On each side of this fine canal, are avenues planted by D'Andelot: here Coligny and Condé have often walked, and a thousand recollections rise as the stranger wanders beneath these shades; the *surintendant* being the last person thought of, while he admires the ceaseless flow of waters, which rush and foam down the steps of the Doric temple before him. Everywhere the waters are of equal magnitude; they leap from mouths into the *fossés* which surround the mansion, and keep the stream constantly running, as if a river flowed beside the walls. All is bright, sparkling, and grand, inside and out; but there is nothing now of the superabundant ornament, which probably appeared at the time when the too-famous Marion Delorme

descended to share the dwelling of the rich financier, for whom she could afford no better praise than—"ce gros homme est d'agréable conversation, et très propre." She, however, allowed him the honour of calling her, during her sojourn under his protection, "Madame la *Surintendante*." The enormous expense she put him to is almost incredible; and there is a story of a necklace of such ruinous value, which she insisted on his presenting to her, that it exceeds in extravagance all recounted of the munificence or ostentation of a millionaire, resolved to excel all the nobles of the court in heaping riches on a woman, the most famous of her time for profligacy and profusion. The mansion at present belongs to the Marquis de Tanlay, who keeps it up with great property and splendour, and appears fond of the place, although less frequently there than previous to the loss of his wife, to whose memory he had erected a beautiful chapel in the best taste, on the site of the ancient one dedicated to Saint Emilien. No one in that neighbourhood should neglect to visit this delightful abode, replete with recollections, and one of the finest residences in the kingdom.

OUR WEEKLY GOSSIP.

A subscription is very actively on foot in Edinburgh for a monument, to be erected in that city, to the memory of Sir David Wilkie. The London subscription with a like object is advancing rapidly, and the result will be a sum worthy of the great name it is object to honour. The public meeting is to be held *this day*, Sir Robert Peel in the chair. Men of all parties will certainly attend for so national and so worthy a purpose—

Chiefs out of war and statesmen out of place—so that the meeting promises to be one of unusual interest.

As we have always said, the love for Art is on the increase in this country, and the masses are now manifesting an interest in "animated canvas"—it is an appetite that grows with what it feeds on. The government feel this, and wisely exert themselves to contribute to its nurture. The result is manifest in many ways—among others, at Hampton Court, where two more rooms will be opened next week. Before the accession of William the Fourth, in 1830, the number of state rooms open to the public was nineteen, the number of pictures about *two hundred*; the rooms shown are now in number *twenty-four*, and the pictures upwards of *eight hundred*. We have seen several of the pictures which next week will drag from undeserved obscurity. There is a very large and fine Snyders—a Boar Hunt, as usual; a divine *Old Francia*; one or two of Gainsborough's dashing first thoughts; a very nice little sketch by Frank Hals; a curious full-length of old Gondomar, the Spanish Ambassador here in the reign of James the First; Allan Ramsay's best picture; and a very fair Hoppern or two. Is there not a stray Holbein among the neglected treasures in old Queen Caroline's closet at Kensington?

At Mr. Rainy's, of Regent Street, was sold last Saturday a collection of pictures, rather limited than select. A tolerable "Waterfall," by *Ruysdael*, brought 153*l.* 5*s.*, and a middling "View of Dort," by *Cuy*, 58*s.*; "George the Fourth, when Prince of Wales," a duplicate of the portrait at Hampton Court, by *Hoppner*, went, like one of the "Surfaces," at the price of old furniture—fourteen guineas! *Hobbema* always obtains a pet price from English connoisseurs—nearly thousand pounds (977*l.* 10*s.*) being given for an ill-painted hotel in a fine woodland. There is little promise of a rich harvest to be housed this year by collectors of pictures any more than of corn. We see nothing advertised at Messrs. Christie's, and little only at the other sale-rooms.

The last musical institution formed in London is not the least interesting. We allude to the Motett Society, the object of which, according to its prospectus, is the practice and publication of "the ancient choral music of the Church, understanding, by this term, the sacred compositions of the best masters, down to the middle of the seventeenth century." We have, more than once, pointed to the system of association as one calculated to influence musical publication, and, with it, popular taste: and every year must bring it into wider operation, for which reason no fresh comments are needed. The taste, too, for vocal music among us, is spreading so

fast and so healthily, as only to require a simple announcement of every new manifestation. It is then time to ask, what can be done for instrumental music for the orchestra and the chamber? Are there none of our amateurs who will bestir themselves for the revivification of this branch of the art? We find a notice in one of the foreign musical gazettes, which is in some wise germane to the matter, as furnishing a hint. "The musical societies," it tells us, "of Heidelberg, Manheim, and Spires, some time since offered a premium for the best trio for the pianoforte, violin, and violoncello. Three works were, in consequence, sent in to the Committee, the successful one being the composition of M. Louis Wolff, of Vienna."

The musical drama of France has sustained a loss in the recent decease of M. Hippolyte Monpou, whose operas, "Lea Deux Reines," "Piquillo," and "La Chaste Suzanne," though none of them first-rate, were welcome, as varying the modern repertory, and displaying a composer cleverly trained in the principles of his school. His death was accelerated by the fatigue and anxiety attendant upon the completion of a work promised to the *Opéra Comique*. A funeral service was celebrated to his memory in the church of St. Roch, at which Duprez sang a motett arranged from some of the *motifs* of his comic operas (!) by M. Dietrich, the chapel-master of St. Eustache.—A plan is talked of to build a new French opera house close to the *Palais Royal*, in the Rue Vivienne, the present edifice, however splendid, being merely a provisional one. We may close this paragraph of scraps, with the name of that anxiously sought-for thing—an Italian composer of promise—Il *Maestro* Degola, which begins to figure in the Italian papers. Now is his time if he have any mettle in him. The opera by Peri, of which we spoke a few weeks since, is also we hear much in request.

The French journals mention likewise, that M. Frézier, whose work on "The Dangerous Classes of Society" was reviewed in this paper (No. 649-50) has announced himself as a candidate to fill the vacant *fauteuil* of the late Compte de Cessac, in the Academy of Moral and Political Sciences.—And the same papers give the text of an interesting report made to the King by M. Villemain, the Minister of Public Instruction, on the subject of the various manuscripts in the ancient and modern languages, existing in the various libraries of the French departments;—and of a royal decree in conformity with the minister's demand, ordering (and appointing the funds for) the formation of a general and detailed catalogue, on a uniform system, of all these scattered treasures—reserving to each of the libraries its rights over its own share in this at present buried wealth, increased in value as they will be, by publicity and classification,—and providing for extracts from such of them as may seem to be of greatest present interest. The importance of such a publication, for its probable contributions to the political and literary history of the nation, and for the ready access which it will afford to inquirers in those directions, is too obvious to be insisted on here.

From Munich, it is stated, that the sculptor Stigelmayer has succeeded in perfecting his galvano-plastic process—obtaining in his work-rooms, results the most extraordinary, which he has since submitted to the public inspection of the artists and amateurs of that capital. In the space of two or three hours, colossal plaster statues are covered with a layer of copper, presenting the nicest details with extreme delicacy, and giving at the same time all the solidity of appearance belonging to similar figures cast in bronze. The same process has been applied to small objects, such as flowers, plants and insects; and the metallic covering renders all the delicacies of form—so it is said—with a fidelity as exact as if they had been executed by the hand of an artist.

Letters from Meiningen speak of the destruction, in a violent tempest, by which that country had been visited, of one of its curious monuments, the old oak of Luther, planted on the 6th of May 1521, on the spot where, on the previous day, the great reformer had been seized and conducted to the castle of Wartburg. Notwithstanding its great age, the tree was still vigorous, and spread its leafy branches over a wide circumference. Its relics were carried in solemn procession to the church of Steinach, where they have been deposited in a vault, and the Grand-

duke has given orders for the erection on the spot where they grew of a Gothic fountain, to be surrounded by trees, and bear an inscription commemorating the event which the tree itself has ceased to record.

From Naples, it is stated that the Government has resolved upon undertaking new excavations, on an extensive scale, at Herculaneum and in its environs. With this view, negotiations are already commenced for the purchase of various estates in the neighbourhood; and the works will be commenced so soon as these shall have become the property of the State. The Minister of the Interior, in conjunction with the Royal Academy of Sciences, is to appoint a Commission of Archeologists and Architects to preside over the excavations.—To this piece of Neapolitan intelligence, we may add the announcement, on a kindred subject, that the Chevalier Zahn, who, for the last seven years, has been exclusively employed in copying the most remarkable of the paintings found in Pompeii, is about to publish his collection, at the expense of the Government. To these engravings the Chevalier applies a new litho-chromatic process, invented by himself, enabling him to make use of oil colours; and the early proofs of four of his plates, obtained by this method, are now exhibiting to the public, and attracting much admiration.

THE DIORAMA, REGENT'S PARK.

The TWO NEW PICTURES now exhibiting represent the Interior of the CATHEDRAL OF AUCH, in the South of France, and the SHRINE OF THE NATIVITY, at Bethlehem, taken from a sketch made on the spot by Mr. Roberts, R.A., in 1838, with various effects of light and shade. Both Pictures are painted by M. Renoux. Open from Ten till Five.

ROYAL POLYTECHNIC INSTITUTION, REGENT STREET. NEW LECTURES on the DAGUERREOTYPE and PHOTOGRAFIC PORTRAITS, with Illustrations, and a full EXPLANATION OF THE PRINCIPLES OF THE DAGUERREOTYPE and ELECTRO-MAGNETIC PRINTING TELEGRAPH. On BARWISE and BAIN'S PATENTED ELECTRIC CLOCKS, in action. Also other interesting Lectures and Experiments. CARY'S ORNERY and the NEW DISSOLVING VIEWS. Nearly 1000 Works which display all the Art, Science, and Industry. Microscope, Dior, Driven Bell, CANTON, and other beautiful COSMORAMIC VIEWS, are added to the Evening Exhibition.—Admission, 1s.

Under Her Majesty's Royal Letters Patent.

DAGUERREOTYPE PORTRAITS.

ROYAL ADELAIDE GALLERY, LOWTHER ARCADE, WEST STRAND.—Mr. CLAUDET is now taking Portraits and Groups of Figures, made on the Daguerreotype, upon glass, and upon paper, to which, by his application, Mr. Claude is enabled, without any additional charge, to fix the Portraits, and render them so durable, that they will not fade or turn black. The state of the weather offers no impediment to the process; and particularly, as the Portraits are taken directly, and assisted with the like-ness. The Exhibitions and Apparatus are now being augmented, and a variety of new and interesting Models will be added to the Collection in the Gallery. Open daily from half-past 10 till 6 o'clock.—Admission, 1s.; Children, half-price.

MUSIC AND THE DRAMA

GLOUCESTER MUSICAL FESTIVAL—1841.

The Annual Eighteenth Meeting of the Choirs of GLOUCESTER, WORCESTER, and HEREFORD, for the benefit of the Widows and Orphans of Clergymen in the three Dioceses, will be held on TUESDAY, WEDNESDAY, THURSDAY, and FRIDAY, the 7th, 8th, 9th, and 10th of September, under the Patronage of Her Most Gracious Majesty the QUEEN.

Stewards.

The Hon. Augustus H. Moreton, The Hon. and Very Rev. the Sir Michael Hicks Beach; The Rev. B. S. Claxton, D.D.

Walter L. Lawrence, Esq. The Rev. James Sevier.

W. G. Venables, Performer. Mademoiselle Dour, Gras, Signor

Bizzi, Signor Tamia, and Mademoiselle Gauvain, Varieté, Miss Birch, Miss M. Marshall, and Miss Maria B. Hawes, Mr. Bennett, Mr. Hobbs, Mr. A. Novello, and Mr. Phillips.

Leaders. Messrs. Crane & Loder; Conductor, Mr. Annot.

Instrumental Band and Chorus have been selected with great care, from the best of the Philharmonic, Italian

Opera, and Concert of Ancient Music, and from the Choral Societies and Choirs of Exeter Hall, Birmingham, Liverpool, &c. &c. the whole comprising between THREE AND FOUR HUNDRED PERSONS.

TUESDAY MORNING: Secured Seats, 5s.; Nave, 3s.; Aisles, 1s.

WEDNESDAY, THURSDAY, and FRIDAY MORNINGS: Secured Seats, 2s.; Nave, 1s. 6d.; Aisles, 5s.—For the EVENING CONCERTS, 10s. 6d.—Tea and Coffee, 1s. each.—For the FULL DRESS BALL: Gentlemen's Tickets, One Guinea; Ladies' Tickets, 1s. 6d.

REGULATIONS: The Ballot for choice of Secured Seats will take place at the Bell Hotel, on Monday, August 20, from One till Four o'clock.

Persons residing at a distance, and being desirous of securing places by anticipation, in the number required, by letter (post-paid), addressed to Mr. Jew, Westgate-street, and remitting at the same time the amount, may rely upon having the same advantage of choice exercised in their behalf, if they were present in person.

Mr. J. WEIPPERT'S celebrated QUADRILLE BAND is engaged for the FULL DRESS BALL.

ENGLISH OPERA.—Mr. Stephens's "magnificent Dramatic Poem," to quote the language of the playbill, has been subjected to the test of representation, and the absence of every quality in "Martinuzzi's" requisite for an acting play, demonstrated beyond question: even the author himself must be convinced of its failure, unless irrepressible laughter throughout the tragedy, bursting from the disinterested portion of a patient and attentive audience, fail to carry conviction

with it. We shall not attempt a sketch of the plot—it will be sufficient to say that it is improbable to absurdity, and disagreeable to boot. The dialogue is so overlaid with imagery, that it is difficult to get at its meaning, but so far as the ideas are discoverable through the web of glittering verbiage which veils them, they are puerile and commonplace; and when, in order to be forcible, the author condescends to speak plainly, the baldness of his phrase is no less remarkable than its bombast on other occasions: all the characters are on stilts from first to last, except an eccentric-looking personage in a fur cap, who is free and easy after a bearish fashion. The performers exerted themselves to the utmost, and Mrs. Warner and Mr. Phelps acted finely; that they were able to give any effect whatever to such inflated nonsense as they had to utter is surprising; they were placed in a most painful situation, for while admiring their efforts it was impossible to refrain from laughter. Whether the result of this first experiment will be considered conclusive, as regards the other unacted dramas, remains to be seen; but we think the public will come to the conclusion, that the managers after all are better judges than the authors of what is fit for the stage. Captain Marryat's farce was an equally signal failure.

A party of musical amateurs, calling themselves "The Operatic Society," performed "Figaro" at the same theatre on Wednesday, in a very creditable manner, so far as regards the concerted pieces generally. Criticism on a performance of this nature is out of the question; it was not to be expected that untrained vocalists would satisfy the demands of this fine musical comedy, though we might have not unreasonably expected a little more of spirit and less of coarseness. The very attempt, however, and the pains which had evidently been taken in rehearsals, deserve praise; and the amateurs have set the example of a better "adaptation" of "Figaro" than that which has hitherto disgraced the English stage, by translating the *libretto* anew, and giving all the music, with one or two trifling exceptions, and as much of the recitative as the circumstances admitted. Among the performers, we recognized in the representative of the *Count*, Mr. Hughes, the leader of the orchestra of Covent Garden, whose experience must have been, in many respects, serviceable to the company; and the *Basil* of Mr. T. H. Severn merits recognition. The audience was apparently composed principally of friends, to whom the performance gave abundant satisfaction.

At the HAYMARKET Mr. Placide has made an attempt at humorous comedy as *Acres*, in "The Rivals," but with even less success than in *Sir Peter Teazle*: his acting, indeed, was wholly ineffective, though the situations are such as to carry the audience along with the actor. Mrs. Glover's *Mrs. Malaprop*, however, was a compensation for that and other fallings short: it recalled the palmy days of the stage. Miss Fauci's *Julia* was only a shade too sombre.

The "Concerts d'Été" were, on Wednesday night, disgraced by an attempt to pander to the grossest appetites, by exhibiting a woman clothed so as to imitate an antique statue of Venus, in several groups of sculpture absurdly called "Tableaux Vivans." The offence was resented by many, but encouraged by more. Surely so flagrant a violation of decorum cannot be long tolerated.

NEW MUSICAL PUBLICATIONS.

We are called upon to express our satisfaction in the proceedings of the Musical Antiquarian Society, by their two last publications: *Wilby's First Set of Madrigals*, edited by Mr. Turle. Happily for the English musician and amateur, it is not necessary to expatiate minutely upon the beauties of rich harmony, and delicate adaptation of sound to sense, of which Wilby's Madrigals are full; but to all such foreign critics as love truth better than national prejudice, they may be recommended, as a triumphant vindication of our country from the reproach of poverty in creative musical genius, so long brought against us. A yet stronger protest, however, is furnished by the *Dido and Ennas* of Purcell, his first opera, hitherto in manuscript, and now printed under the careful superintendence of Mr. G. A. Macfarren. Hearty praise is deserved by the latter gentleman, for the accuracy and intelligence with which he has fulfilled his task;

the manuscript having come to his hands with few marks of expression, and no directions of scenic divisions:—these have been most judiciously supplied, as it appears to us, and the publication is complete by the addition of Nahum Tate's words—strange, formal fustian, showing that opera lyrics have not changed their character since the year 1675. Without going the length of those enthusiasts, who, forgetting the incomplete resources of their idol, claim for him a pre-eminence among the eminent musicians of all countries, and will speak about Purcell and Gluck, as though the two had left works of equal value, we cannot but consider this score—the work of a chapel-boy, only seventeen—as a remarkable instance of Genius, creating forms, and applying rules, as it were spontaneously, and thus placing itself, not merely in right of idea, but also as regards manner, by one single bound, at a point which plodders and mechanical imitators will never reach. As specimens of expression, the choruses "To the hills, to the vales,"—the sea-song and chorus "Come away," and the final dirge "With drooping wings"—may be cited as equal to any examples in the contemporary music of France, Germany or Italy: *Dido's last song*, "When I am laid in earth," is even of higher merit; few and simple as are the notes of the vocal part, which the writer has written under the trammels of a ground bass, they still offer a scope to the utterance of pathos in song, which it would be hard to exceed. If the Musical Antiquarian Society continue to present such works in such superb form, its publications will have a value far beyond the mere satisfaction they impart to the subscribers—as enlarging the stores of Europe. We wish that some similar body would undertake to give us the ancient music of France and Germany: for the early essays of art in any country gain a double interest and significance when considered as parts of a large and widely extended whole, which, however various in forms, own one common origin.

It is impossible from this fine old music to pass abruptly to the ephemera of the hour, which the publishers pour so profusely forth. An admirable halting-place, however, is happily provided for us, by the recent publication of Dr. Mendelsohn Bartholdy's last compositions—six four-part songs for male voices, of great beauty, variety and spirit, and six songs for a single voice, to which the same epithets may be applied. Indeed, since Schubert's songs, we have seen nothing so fresh, so exulting, and so original as the "Frühlingslied," a strain impossible to be heard or delivered tamely. Besides these, a fourth set of "Lieder ohne Worte" is not to be forgotten, were it only for the sake of the one in a minor—a fine bold chorus, the wild and bardic character of which is helped by the tinkling harp symphonies between the verses. Lastly, we must announce the publication of the pianoforte score of the "Lobgesang."—The two first movements of the introductory symphony (which is arranged for two performers) lose much by the absence of orchestral contrast—but the vocal part has been essentially strengthened by the introduction of several new movements for solo voices, to replace the connecting links which originally united the choruses. These alterations were completed, and in England, as we took occasion to remark at the time of the execution of the work by the Philharmonic Society, and it is no credit to "the powers that were" to have rejected them.

Ere we close an article devoted to works of that more select class, which are not aimed at the million—we must speak of *Six Waltzes for Pianoforte and Violin Concertant*, by I. Z. Hermann. These, be it understood, are not dancing tunes.—Of later days, the *genra* of waltz, minuet and scherzo, have shown an inconvenient disposition to cross and intermingle: and the compositions before us partake of the two first characters:—the third of the set is grave, pathetic, and most expressive in its melody,—the fourth and sixth, too, are no less admirable. For the proper performance of this music, a thoroughly educated violinist is required: and one whose powers of expression have been cultivated, as well as his mechanical powers.—There are also *Six Waltzes for two players on the Pianoforte*, by the same composer, which are to be recommended for their gaiety, grace, and brilliancy. Though in a trifling form, they are anything rather than trifles.—But is the day of great composition—of trios, sonatas, and such sterling works—gone by for ever?

The Lady's Reply to "The Candid Wooing."

[The writer of these lines presumes to hope that she may have "a corner to sit in" (as the Easterns have it) amongst the literary and scientific next week. Mr. Mackay evidently thinks he is doing the thing "gintalely" in "cutting up his heart into a number of small pieces," and presenting Benjamin's portion thereof to his "bride elect."

"Then up and spake that young bride's (champion,) As never was heard to speak so free."

And what she had written she signed.

U B ——.]

Thou canst not give me all thy heart,

Most candid lover!

The man who can divide his heart

Is not true lover.

Thou singest well, that youth's hot fire,

Impetuous passion, fierce desire,

Can bring no lasting happiness;—

For Love alone hath power to bless;—

True Love,—that cannot pass away,

That cannot dwindle nor decay

In heart of a true lover.

Passion—unmingled with respect,

Most gentle lover!

Is, truly, worse than cold neglect

From faithless lover.

But true Love is a passion true,

Warm as the sun, though soft as dew,

Nor brook, nor torrent, but an ocean

Changeless, yet varying still its motion,

Measureless, boundless, full, and deep,

Love hath not quite the calm of sleep,

In heart of a true lover.

For only a divided heart,

Most prudent lover!

I cannot give my woman's heart

To any lover.

I would give all!—I ask no more,—

But less than thy heart's inmost core

Would not suffice to gain my heart,

I could not love, and love in part,—

Yet Faith, Friends, Honour, I hold dear,

And I would be to all sincere,

Then, surely, to true lover.

August 7.

ELEVENTH MEETING OF THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

[From our own Correspondents.]

TUESDAY, AUGUST 3.

SECTION A.—MATHEMATICAL AND PHYSICAL SCIENCE.

'Report of a Committee, consisting of Sir J. Herschel, Mr. Whewell, and Prof. Baily, for revising the Nomenclature of the Stars.'

As regards the collection of synomyms, the detection of errors originating in mistakes of entry, copying, printing, or calculation, and their rectification, and the restriction within their just boundaries of the existing constellations, the work of your Committee has been progressive. * * As regards the revision and re-distribution of the southern constellations, a catalogue has in the first place been prepared of all stars within the circle of 70° S.P.D. down to the 5th magnitude, with their present actual magnitudes, as determined by a series of observations made expressly for that purpose, which catalogue is now in course of printing and publication by the Royal Astronomical Society. With the magnitudes of this catalogue a chart has been constructed, of which, several copies having been made, these have been employed for the purpose of grouping the stars in various ways (without regard to existing constellations), and with reference only to forming among themselves the most compact and striking groups which their distribution in the heavens admits, and which the correctness obtained in the magnitudes has now, for the first time, rendered practicable. After trying many systems, and arranging the groups in a great variety of ways, your Committee have agreed on adopting, as the boundaries of the new regions into which they propose distributing the southern stars, only arcs of meridians and parallels of declination for a given epoch; thus including each region within a quadrilateral rectangular figure, whose angular points being tabulated in R.A. and declination, may be treated as artificial stars, and thus brought up by the usual tables of precession to any other epoch, their situation among the stars being unchanged. Thus it will become a mere matter of inspection of a catalogue arranged for the original epoch (which they propose to be that of the Royal Astronomical Society's forthcoming new Catalogue), which region any given star shall belong to. Proceeding then to assign more particularly the limits of the several regions, they have succeeded in forming an arrangement, in which (subject to such revision and modifications as may arise between this and their final Report,) they feel disposed to rest. * * As respects the nomenclature of the new regions, the Committee are at present engaged in considering it; but some principles, which will probably influence their recommendation when the subject is sufficiently advanced for that step, are stated in a paper, which will appear in the forthcoming volume of Transactions of the Royal Astronomical Society. But the same necessity (grounded on the incorrectness of magnitudes, as laid down in all existing charts,) exists for a revision of the northern as well as southern stars in this respect. It therefore becomes worthy of consideration, whether a similar plan may not advantageously be carried into execution in both hemispheres. And as, at all events, the actual state of the celestial charts in both is such as to admit of great improvement from an assemblage of more correct photometric data, a general review of all the stars, down to the 5th magnitude, with this especial object in view, has been undertaken by one of the members of the Committee, con-

ducted on the same plan, the principle of which is explained in the paper alluded to. This review is already in a considerably advanced state, and, should circumstances and weather favour, will probably be completed before the next meeting. * * Signed, on the part of the Committee, July 30, 1841. J. F. W. HERSCHEL.

'Report of a Committee, consisting of Sir J. Herschel, one to Superintend the Reduction of Meteorological Observations.'

During the last year, several series of observations for the years 1837 and 1838, as well as a few for 1839, have dropped in, and every endeavour has been made to procure copies of such as were still wanting from stations where there was reason to presume that observations were forwarded but had never come to hand. These endeavours, in several instances, have proved successful; and, in consequence, the list of stations at which available series, showing some degree of consecutive ness and connexion, can be made out, is considerably enlarged. The whole number of series in hand and under reduction, at present amounts to upwards of 300, being the results of observations at about 60 stations. In the year elapsed, Mr. Birt has been employed in tabulating, reducing, projecting, and comparing the barometric curves, process which has been completed for the whole of the American group (which is by far the most numerous and consecutive,) for the years 1835, 1836, 1837, and for March 1838, comprising 88 series, made at 28 stations. One term also has been reduced and projected (for June 1836) for each of the other groups, comprising 17 series, at the same number of stations, making, in all, 105 series reduced and projected. The tabulated results of these reductions, and their projected curves, accompany this Report for the inspection of the Meeting. The curves are purposefully projected on a large scale (too large for publication,) to afford room for a minute examination and analysis of their several inequalities, with a view to the possibility of tracing the progress of subordinate undulations, or of cross waves; and each has been made by Mr. Birt the subject of particular and careful discussion, the results of which he has embodied in the form of notes on the several terms. * *

July 1841. (Signed) J. F. W. HERSCHEL.

The PRESIDENT submitted a series of curves, prepared by Lieut. Riddell, representing the simultaneous changes of the magnetical elements, observed at Toronto, Dublin, Brussels, Prague, Milan, St. Helena, and Van Diemen's Land, on the 29th of May and 29th of August 1840.

He said that one of the chief objects kept in view in the arrangement of the great system of combined observation now in operation, was the extension of the plan of simultaneous observations at short intervals of time, first laid down by Gauss. The results of this system had been, that the observed changes of the magnetical elements were strictly simultaneous at the most remote stations at which observations had been hitherto made; and that these changes followed in all cases the same laws, the representative curves being similar to one another in all their inflexions, and differing only in the magnitude of the change. This similarity had been found to extend to the utmost limits of Europe, and to hold at stations as remote as Dublin, Petersburg, and Milan. It became, therefore, a question of great interest in the extension of this system to still more distant stations, to determine whether there were any, and what, limits to this accordance. This question was determined by the very first results of the observations recently established by the British government, and the observations now laid before the Section were selected as elucidating it in a very marked manner. These observations were those of the declination and horizontal magnetic intensity observed at Brussels, Milan, Prague, Toronto, and St. Helena, on the 29th of May 1840, and at Dublin, Toronto, St. Helena, and Van Diemen's Land, on the 29th of August of the same year. The magnetical disturbances which occurred on these days were among the most considerable which had been as yet observed. On the former day, the declination at Toronto underwent a sudden change, amounting to 1° 52' in about twenty minutes of time, while the disturbance of the horizontal force was so great as to carry the magnet beyond the limits of its scale. On the latter day, the greatest change of the declination amounted to 1° 26' at Toronto, and to 1° 18' at Dublin. The greatest change of the horizontal intensity at the former station amounted to .028, or about $\frac{1}{35}$ part of the whole intensity; while at Dublin the change was even greater, and extended beyond the scale of the instrument. It is probable that an attentive comparison of the curves may lead to many important results; but there are some which appear upon a cursory inspection, which Mr. Lloyd said that he should now notice. The first of these was, that the greater magnetic disturbances appeared to be synchronous at the most distant stations. This important fact is exhibited much more evidently in the changes of horizontal intensity than in those of declination;

and, if verified by further comparisons, leads to the conclusion that the principal forces which disturb the magnetic equilibrium of the earth are not of local agency. The next circumstance which merited attention was, that the order of the changes was no longer regulated by the same law at very remote stations; the representative curves exhibiting none of that similarity already referred to, which was shown within the limits of Europe, and the epochs of the successive maxima and minima presenting no agreement whatever. This important fact was first brought to light in the course of a series of simultaneous observations, made by Prof. Bache at Philadelphia, and by himself at Dublin, in November 1839, in the hope of determining differences of longitude by means of the corresponding movements of the magnet at the two stations. The changes observed in the observations at present under consideration, were, however, far greater in magnitude, and placed the phenomenon in a much stronger light. The last circumstance, to which Mr. Lloyd invited the attention of the Section, was, that the curves of horizontal intensity presented a much nearer agreement at remote stations, than those of declination; from which it may be inferred, that a true knowledge of the nature and laws of the disturbing causes will be better attained by the examination of intensity changes, (including, of course, those of the vertical intensity,) than of those which are dependent solely on the direction of the acting forces. There were many other points of minor interest suggested by the examination of these curves; such as the appearance of a correspondence in some of the minuter changes at all the stations, although the resemblance in the greater changes was obliterated. If this should prove to be anything more than a mere fortuitous coincidence, the result might be expected to lead to some important conclusions with regard to the acting forces.

Prof. CHRISTIE observed, that there were two classes of change involved in these observations: namely, the regular changes, which depended on the hour, the time of which was, of course, different in places differing in longitude; and the irregular movements, which were supposed to be strictly simultaneous. He thought that the want of agreement in the curves representing the changes at remote stations, must be in part due to the combination of these two kinds of change.—The PRESIDENT replied, that the superposition of the regular diurnal change upon the irregular fluctuation, would undoubtedly have some effect in altering its character; but by no means such an effect as to account for the observed discordances. The former was a slow and regular fluctuation, running through all its phases in about half a day; the latter was composed of an indefinite number of irregular oscillations, which were often far greater in magnitude than the regular change, and were frequently accomplished in a few minutes of time. The superposition of the former upon the latter would, therefore, produce an effect like that of a long and slow swell of the sea upon a multitude of near floating bodies, but could not alter the order of the successive maxima and minima, nor perceptibly change the epoch of their occurrence.—M. QUETELET was desirous of inviting the attention of the Section to another class of magnetical changes, which he had frequently late observed with much interest. It frequently happened, he said, that the magnetic bar commenced to oscillate, from a state of comparative repose, although its mean position was undisturbed. He thought it would be very interesting to trace the connexion of changes of this class with other phenomena.—Mr. SNOW HARRIS observed, that changes of the nature now noticed were often the effects of currents of air, produced by unequal temperature, and other accidental influences; and he was of opinion that we could arrive at no satisfactory conclusion in observations of this nature, unless the experiments be made in *vacuo*.—Prof. CHRISTIE said, that a phenomenon quite analogous to that observed by M. Quetelet had been noticed by Mr. Baily, in his experiments with the apparatus of Cavendish; and he thought that, in both cases, it probably had a mechanical origin.—The President said that he had frequently occasion to notice the phenomena described by M. Quetelet in the course of his own observations. It was also made the subject of particular inquiry in the observations established by the British government, and especially at the Canadian observatory.

Giving the fullest weight, as he did, to the disturbing influences mentioned by Mr. Snow Harris and Prof. Christie, he was yet convinced that the phenomenon was a true magnetical one; and he had observed some facts which led him to think that disturbances of this class were due to sudden disengagements of electricity in the atmosphere.

The President then laid upon the table the curves representing the changes of magnetic declination, observed at New Cambridge University, (Massachusetts), by Mr. W. C. Bond, on the Term-days of May and October, 1840. The corresponding observations made at the magnetical observatory of Toronto, by Lieut. Riddell, were laid down in a curve in connexion with the latter. The results exhibited the same close agreement in the forms of the curves, and in the epochs of the successive maxima and minima, as had been already noticed in Europe; although (as before remarked) all resemblance between this and the European system of changes is nearly obliterated. New Cambridge is distant about 500 miles from Toronto; the mean declination there is $9^{\circ} 20' \text{ west}$.

Prof. WARTMANN (of Lausanne) read a paper on, what he calls, Daltonism. He observed that one of the most extraordinary affections to which the eye is subject, consists of an incomplete vision of colours, which has been called Daltonism, after the celebrated Professor, who was the first to describe it in an exact manner. He then laid before the meeting an extract from a more extended work, containing, in substance, the following observations. The Daltonians form two classes—that of the *dichromatics*, who only discern two colours—generally black and white, and who appear endowed with a remarkable faculty of vision in a state of darkness, and that of the *polychromatics*, who have the definite perception of at least three colours. Daltonism is not always hereditary; it does not, even, always date from the birth. Decided colours appear black to many Daltonians, if they be not illuminated by a very brilliant light. The number of colours of which the polychromatic Daltonians are sensitive is not constant—some only see three, others four (among which blue and red may be expressly mentioned.) The extremes of red and violet are often not distinct; a fact which the Professor thought to have a connexion with the question of the number of elementary colours. The degree of polish of the coloured surface, has an influence on the appreciation of colours. Some Daltonians have an equal cognizance of the brightness and the discoloration of *supplementary* tints, which we do not recognize as such. Two colours appear to us blended by a succession of intermediate tints, which the Daltonians see in contrast. The Daltonians see exactly as we do, the mixed rays discovered in the spectrum by Fraunhofer, at least in all that portion which appears to them illuminated.

Prof. WHEWELL said, that he had himself had an opportunity of witnessing this defect of vision in some individuals, and there were few persons who were ignorant of the fact, that it prevailed in the family of the celebrated Troughton, and if he recollects rightly, the males only of that family were subject to the defect. He mentioned a lady of his acquaintance, to whom the colour of the bright side of a laurel leaf was undistinguishable from that of a stick of red sealing wax. He remembered that when the celebrated man from whose name the present communication had been denominated, was receiving, at Cambridge, a small portion of those honours which he had so nobly earned, and of which his transcendent fame was so deserving, he had asked him what other object the Doctor's gown which he wore, and which was of a bright scarlet, resembled: he pointed to some of the evergreens outside the window, and said, that, to his eye, their colours were quite alike. On the other hand, the lining of the gown, which was pink silk, he could not distinguish from sky blue. Prof. Whewell doubted the propriety of the name now given to this defect: few persons would desire to be immortalized through the medium of their defects, and Dalton, least of all, required such a means of handing down his name to posterity.

On the Preservation of Steel Chronometer Balance Springs, by Mr. Dent.

Mr. Dent said, it was customary to what is technically termed "blue the balance spring" in chronometers—he showed from experiment, that this blue oxygenated surface (or coating) greatly increased the

elastic force of the spring, and that on its removal, the balance spring suffered a nearly corresponding loss; that this rigid oxygenated coating, on its first formation by heat, increased the strength of the balance-spring, more than the additional application of the gold on its surface: and there was this difference, that while this blue oxygenated surface might be considered as a first process of rust, that the gold surface was a protection from the ill effects of damp and saline atmospheres, to which chronometers are subjected on shipboard, and particularly in tropical climates. Mr. Dent first applied the gold to a chronometer balance-spring which had been previously rusted; on it being replaced in the chronometer, he found the rate of the chronometer to be losing 41 seconds in 24 hours, which was caused by the removal of the blue oxygenated surface, and the gold coating not increasing the elastic force to compensate for the removal of the blue surface from the balance-spring.—Mr. Dent, in another paper, communicated the result of his experiments on the glass balance-spring in chronometers, since his first communication made to the Association at Cambridge in 1833, with observations on its official rate, resulting from five years' trial, by order of the Lords Commissioners of the Admiralty.

On the Preservation of Magnetic Needles and Bars from Oxidation, by the Electrotype Process, by Prof. Christie.

The preservation of the identity of magnetic needles or bars, employed in determining the terrestrial magnetic intensity, whether statically or dynamically, both as regards their magnetism and their weight, is so evident, that it is unnecessary here to dwell upon the subject, but the Professor mentioned that even in the case of the ruder instruments employed as ships' compasses, it has been considered by experienced naval officers, that it would be advantageous if the needles were efficiently protected from oxidation. On learning that the electrotype process had been applied by Mr. Dent to the protection of the balance springs of chronometers, by forming a coat of pure gold on their surface, it occurred to him, that the same process was admirably adapted for protecting magnetic bars and needles from oxidation. He now presented to the Section two needles which, after having been magnetized, were coated with gold by this process. He considered that the same process could be advantageously applied to the protection of the axes of dipping needles. This, however, is a question which can only be decided by careful experiment, as it is very possible that the coating of soft gold on the axis might so much increase the friction on the agate planes, as to render the application of the process in this part of the needle objectionable. The needles presented are of clock spring, and were magnetized in the ordinary way, by double touch, previously to being subjected to the electro-metallurgical process. Their weights before they had received the coating of gold were 223.4 grains, and 222.1 grains, and afterwards 227.8 grains, and 223.8 respectively; so that the coating of gold on the one was 2.4 grains, and on the other 1.7 grain. Previously to the application of this process of gilding, it is quite necessary that the surface of the needle should be well polished and perfectly clean. It will be noticed that, in the specimens before the Section, which are a first attempt, in consequence of defect in the polish, the process has failed in particular points. This arose from his desire of not having the original surface of these needles much rubbed down; with due care and attention, it may easily be avoided.

Dr. ROBINSON inquired whether any experiments had been made to ascertain the amount of protection actually afforded by the process: to him it appeared that it was possible that, since the gold was deposited in a kind of granular form, some parts might escape protection; if this were so, an action of increased energy would be the consequence, as there would here be a complete galvanic arrangement.—Mr. DENT replied, that he had tried the experiments, and in confirmation of Dr. Robinson's remark he must say, that the greatest care was requisite, particularly in preparing the steel by polishing and previous cleaning for the reception of the coating of gold. If the smallest part was left unprotected, a very rapid action on that part was the consequence; but when the coating was complete, it afforded a perfect protection. He found it an excellent test of this to confine the

protected spring or needle, as the case might be, for a few days over water.

* On the Relation of Sturm's Auxiliary Functions to the Roots of an Algebraic Equation, by Prof. Sylvester.

The author availed himself of the meeting of the Association, to avail under the more general notice of mathematicians his discovery of the real nature and condition of the auxiliary functions, so called, which Sturm makes use of in *locating* the roots of an equation: these are obtained by proceeding with the left hand side of the equation, and its first differential co-efficient, as if it were our object to obtain their greatest common factor; the successive remainders, with their signs *alternately* changed and preserved, constitute the functions in question. Each of these may be put under the form of a fraction, the denominator of which is a perfect square, or, in fact, the product of many; likewise the numerator contains a huge heap of fractions of a similar form. These, therefore, as well as the denominator, since they cannot influence the series of *signs*, may be rejected; and furthermore, we may, if we please, again make every other function, beginning from the last but one, change its sign, if we consent to use changes, wherever Sturm speaks of calculations of sign, and *vice versa*. The functions of Sturm thus modified and purged of irrelevancy, the author, by way of distinction, and still to attribute honour where it is really most due, proposed to call "Sturm's Determinants," and proceeds to lay bare the internal anatomy of these remarkable forms. He uses the Greek letter ζ to indicate that the squared product of the differences of the letters before which it is prefixed is to be taken. Let the roots of the equations be called respectively a, b, c, \dots, l , the determinants, taken in the inverse order, are as follows:—

$$\begin{aligned} & \zeta(a b c \dots l) \\ & \zeta(b c e \dots l) x - \zeta(b c e \dots l) \\ & \zeta(c e \dots l) x^2 - \zeta(a+b) \zeta(c e \dots l) x + \zeta a b \zeta(c e \dots l) \end{aligned}$$

$$\zeta [\zeta (k l) (x-a) (x-b) (x-c) (x-e) \dots (x-h)]$$

It may be here remarked, that the work of assigning the total number of real and of imaginary roots falls exclusively upon the co-efficients of the leading terms, which the author proposes to call "Sturm's Superiors." These superiors are only *partial* symmetric functions of the *squared differences*, but *complete* symmetric functions of the *roots themselves*, differing in this respect from those other (at first sight similar-looking) functions of the squared differences of the roots in which, from the time of Waring downwards the conditions of reality have been sought for; it seems to have escaped observation that the series of terms constituting any one of the co-efficients in the equation of the squares of the differences (with the exception of the first and last) each admit of being separated and classified into various subordinate groups, in such a way that instead of being regarded as a single symmetric function of the *roots*, they ought to be received as aggregates of many. In fact, Sturm's Superior, No. 1, is identical with Waring's co-efficient, No. 1. Sturm's Superior, No. 2, is a *part* of Waring's co-efficient, No. 3. Sturm's Superior, No. 3, is a *part* of Waring's co-efficient, No. 6, and so forth, till we come to Sturm's final Superior, which is again co-extensive and identical with the last co-efficient in the equation of the squares of the differences. The theory of symmetric functions of forms, which are themselves symmetric functions of simple letters, or even of other forms, the author states his belief, is here for the first time shadowed forth; but to enter further into it would be beside his present object. He concludes with calling attention to the importance to the general interests of algebraical and arithmetical science, that a searching investigation should be instituted for showing *a priori* how, when a set of quantities is known to be made up partly of possible and partly of *pairs* of impossible values, symmetric functions of these, one less in number than the quantities themselves, may be formed from the signs of the ratios of which to unity and to one another, the number of possible and impossible quantities may at once be inferred; in short, we ought not to rest satisfied until from the very *form* of Sturm's Determinants, without caring to know how they have been obtained, we are able to pronounce upon the uses to which they may be applied.

Prof. CHRISTIE urged upon the Section the im-

portance of viewing Sturm's Theorem as a matter not alone of pure theory, but with a view to its practical application, and requested Prof. Sylvester to state whether he considered that his method would facilitate the actual work of finding the places of the roots, upon the principles of Sturm; as, for instance, whether it could be employed more advantageously than the processes of abbreviation which Dr. Young, of Belfast, in his late volume of researches had given to the world upon this subject.—Mr. SYLVESTER replied, that he did not consider that the theory which he had just imparted, could be advantageously employed to furnish a practical method of computation; but in a paper which he had lately read before the Royal Irish Academy, an abstract of which is given in their Proceedings, he had virtually furnished a means founded on his previous discovery of the linear method of elimination, which reduced the amount of numerical labour to the absolute minimum of which, from the very nature of the inquiry, it could admit, and which he thought would be universally allowed to have the effect of superseding even the judicious processes of Dr. Young and all others of a like tentative nature.

A paper was then read, giving an account of a Patent Barometer.—Another on the Rev. Dr. Scoresby's improvement in Sea Compasses, &c.—Dr. Scoresby employs the best cast steel, made from the best iron, and has his needles hardened to the utmost degree throughout, instead of merely hardening the ends; he then applies every compass needle to his test magnet, and at once ascertains its qualities, both as to its strength and endurance. The paper also gave an account of Dr. S.'s improvement in the construction of artificial magnets and bar magnets.

Prof. CHRISTIE observed, that as a member of the Committee for investigating the subject, he thought it right to state that he did not consider there was anything new in the proposition brought forward, inasmuch as the method of communicating magnetism to steel bars now proposed, was very similar to that employed by Dr. Knight. The hardening of the bars throughout, was also a fact well known to every person conversant with magnetism, and the employment of thin plates of steel as compound needles was likewise a plan of long standing. He had in his possession a compound magnetic needle, made of two thin plates of steel, which was constructed by Messrs. W. & T. Gilbert, and placed in his hands in 1823. Prof. Christie also mentioned that several compasses, constructed on principles recommended by the Committee, were already on trial in the Niger Expedition, and in other of Her Majesty's ships. He stated also, that Dr. Knight had constructed a compound magnet, consisting of three thin plates of steel, which sustained nearly eighty times its own weight.—The CHAIRMAN said that one of the compasses recommended by the Committee was on board Captain Ross's ship, and most favourable reports had been made of it.—Mr. WALKER had, in the discharge of his official duties, a peculiarly good opportunity of knowing the importance of this subject. He was placed over the compass department, and he had to try the needles when the ships returned, and it was astonishing how many had to be rejected, having become entirely useless, the chief fault arising from their not having been sufficiently hardened originally.

Report on the Erection of an Osser's Anemometer at Inverness.

The anemometer constructed by Mr. Osser for Inverness, though nearly ready for use, has not yet been erected, in consequence of an unexpected difficulty in finding a suitable building. It was at first proposed to erect it on the roof of Raining's School, where the hourly meteorological observations are made by Mr. M'Kenzie; but the roof of this building was not considered strong enough for the purpose, and other difficulties prevented this arrangement from being carried into effect. The Observatory of Inverness was unfortunately in the act of being transferred from one body of proprietors to another, otherwise the anemometer would have been erected on its summit; but I am informed by Mr. M'Kenzie that the transaction is nearly completed, and that the Committee of the Mechanics' Institute, to whom it will belong, will cheerfully devote a part of it for the reception of the anemometer.

D. BREWSTER.

St. Leonard's, July 22nd, 1841.

Provisional Report on the Hourly Observations at Inverness and Unst.

In conformity with the wishes of the British Association, the hourly observations at Inverness were commenced on the 1st of November 1840; but a difficulty presented itself to their renewal at Kingussie, which it was not easy to overcome. Under these circumstances I felt that I should promote, in the most effectual manner, the objects which

the Association contemplated, by transferring the observations to a more northern locality; and, with the assistance of Dr. Fleming, I succeeded in establishing them at Balta Sound, in Unst, the most northern of the Shetland Islands, already distinguished in the history of science by the astronomical observations made there in 1817 and 1818 by M. Biot and Capt. Kater. Dr. Edmonston, of Bunes, whose love of science induced him to enter warmly into the views of the Association, undertook to superintend the observations, which were begun early in the present year. The island of Unst being situated in lat. 60° 40', Leith in lat. 55° 38', and Plymouth in lat. 50° 22', and all of them nearly in the same meridian, we shall now obtain a series of hourly observations of peculiar value, from their being made at the extremities of the middle of an arch of the meridian of more than 10 degrees.

D. BREWSTER.

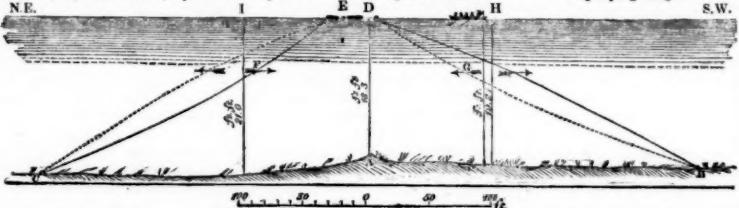
St. Leonard's, July 20th, 1841.

Prof. WHEWELL stated, that the communication he had to make was recommended not only by its being of interest in itself, but by its being a tribute to the merits and memory of an excellent naval officer who had sacrificed his life in the service of science.—Capt. Hewett, who was lost in H.M.S. *Fairy* in the German Ocean in 1840. Prof. Whewell stated, that in addition to the scientific zeal by which Capt. Hewett had secured the good opinion of his profession, he had always found him ready to introduce into his surveys operations tending to further any scientific researches suggested by him. Prof. Whewell added, that the times of high water on the east coast of Britain, and the north coast of Belgium, Holland and Germany, had led him to the conclusion that there must lie towards the middle of the German Ocean, a central space, in which the rise and fall of the tide vanishes. Capt. Hewett had endeavoured to decide this point by observation in 1838, 1839 and 1840; and the following letter was read, showing that a place had, in fact, been found where the tide was much smaller than it is on any part of the coast.

H.M.S. *Fairy*, Harwich, August 31st, 1840.

Sir.—On the 24th inst., being in lat. 52° 27' 30" N. long. 3° 14' 30" E., with light breezes and smooth water, I deemed it a fitting opportunity for making a further trial on the rise and fall of the tide in the middle of the North Sea, and although I was then many miles both to the northward and eastward of the spot near which Mr. Whewell had previously expressed his wishes that the experiment should be made, yet I thought that if good observations by any means could be obtained at the above position, they would, at the least, serve to show, in some measure, the truth or error of that gentleman's theory; either, in the one case, by a sensible diminution of the vertical movement of the tide, when compared with the known rise and fall on the shores of England and Holland, or, in the other, by ascertaining the rise and

fall beyond a doubt to be so great as to throw some doubt on the correctness of the theory in question. But as I apprehend that Mr. Whewell's theory is founded mainly upon the fact, that the tide-waves to make high water on the opposite coasts of England and Holland come from different directions, namely, on the former, round the northern extremity of Great Britain, and so working its way along the eastern coast, and on the latter, through the straits of Dover, and running thence along the coasts of France, Belgium, and Holland, and that it might reasonably be inferred that these waves gradually diminish in importance as they recede from their respective shores, or approach each other, there would be left a broadish space about the middle of this part of the North Sea, where no rise and fall of tide exists; and that, therefore, the waters between the two opposite shores would assume a convex form at low water by the shores, and a concave one at high water. Allowing this view of the foundation of Mr. Whewell's theory to be correct (and I have not his book at present near me to refer to), this line or, more properly speaking, "broad belt," of no rise and fall, would doubtless run for a considerable distance in the north-easterly direction into the North Sea, from the point where it may commence on the North-ea side of the straits of Dover. It would therefore follow, that the fact of my being to the northward of Mr. Whewell's position, would of itself be of no material importance; and by reference to the chart it will be seen, that the longitude places me not many miles to the eastward of the "broad belt" above alluded to. Having thus reflected, I came to the conclusion, that if Mr. Whewell's views were correct, true observations made in this position would exhibit some indications thereof, and I accordingly made the necessary dispositions. A rise and fall by the shore is a case which falls immediately on the conviction, by the sense of sight; but to ascertain the fact of a vertical motion of five or six feet in the middle of a great sea, and out of sight of land, is a solution of no small difficulty, and requires the exercise of many precautions to arrive at anything like correct results. In making an observation of this description, we find two important obstacles in the way of obtaining these; namely, the stream of tide, and the undulating character of the surface of the ground. Under the influence of a strong stream of tide, it is utterly impossible to take a strictly correct depth from the vessel, or a boat at anchor (and therefore a fixed point), for the line will assume a curved form in the act of descent; and after all, from the want of perpendicularity in the line, a large allowance in a depth of nearly twenty fathoms is necessarily left to the exercise of the judgment; and both of these may amount to considerably more than the "rise and fall" sought for. On the other hand, the undulations of the surface renders it essential that the depths should be always taken over some discovered elevated spot. The stream of tide and the undulations of the ground are therefore alternately opposed to the making of observations from which correct results can be derived. I experienced on this, as on the former occasion, considerable difficulty in overcoming these obstacles; but I soon found myself compelled to resort to the former plan (with the addition of such precautions as experience then gave me), namely, that of mooring one boat and taking the depths in another. The accompanying diagram will assist



It will be seen that the observations recorded on the afternoon of the 24th, are not so regular as those of the following day. I attribute this to some degree of *uncertainty*, on account of a long swell, perhaps of one and a half or two feet rise, interrupting the observation at the moment of passing over the overfall, but this little swell had nearly subsided on the 25th, and the depths were then recorded with much satisfaction. It will also be noticed, that at the turn of the stream, about noon of the latter day, the depth had increased to eighteen fathoms four feet, and went on uniformly so; but I investigated the cause of this on the spot, and found that the wind having increased to 2 from W. by S., and therefore operating upon the starboard bow of the boat, had silled her a few feet to the S.E., so as to bring the eighteen fathoms three feet immediately under her, and that, by observing the same distance from the boat while drifting past her (and which was always on her larboard side), I obtained eighteen fathoms four feet, instead of eighteen fathoms three feet. From the care and pains taken in these observations, and that under favourable circumstances, I do not entertain a doubt of the correctness of any one of the depths over the summit of the overfall as recorded on the 25th; but as this interesting result of observations on an unexpected theory may no doubt give rise to a strong desire for further observations as corroboratives, I shall not fail to make such when I find myself in a position, and circumstances, to do so with any prospect of success. It is a difficult observation, and can be made but seldom. In the meantime, I

would offer my congratulations to Mr. Whewell on these results, should they prove, in any degree, gratifying to him.

I have the honour to be, &c.,
WILLIAM HEWETT, Captain.

‘On a Machine for Calculating the numerical values of Definite Integrals,’ by Prof. Moseley.

It is the object of this machine to apply to the numerical calculation of definite integrals, a principle first suggested by M. Poncelet for the registration of dynamometrical admeasurements, which has been applied by M. Morin to an instrument called the Compteur, for registering the traction of loaded carriages upon common roads, and during the last year by a Committee of this Association, to a permanent registration of the work of the steam upon the piston of a steam-engine. The machine about to be described, has some mechanical expedients in common with the last-mentioned machine; it has nothing in common with the Compteur of M. Morin, except the admirable principle of M. Poncelet. In the accompanying figure, D E represents a circular disc, moveable about an axis C, passing

unchanged, whilst that small angle is described by the plate, the circumference of that wheel will describe a space represented by the same quantity $f(\theta) \cdot \Delta\theta$, and the sum of all such spaces described on the same supposition, in respect to other positions of the integrating wheel, or other values of the function $f(\theta)$, between the limits θ_1 and θ_2 , will be represented by the sum

$$\sum_{\theta_2}^{\theta_1} f(\theta) \cdot \Delta\theta$$

If, therefore, the broken or interrupted variation here supposed to be given to the distance C P, (and which may be conceived to be communicated by a jagged or step-like form of the edge e f,) be replaced by the continuous variation actually communicated to it by the curve, this sum will pass into the definite integral—

$$\int_{\theta_2}^{\theta_1} f(\theta) \cdot d\theta$$

Now, if N represent the number of revolutions and decimal parts of a revolution described by the frame or integrating wheel, and ρ the radius of that wheel, this sum (or whole space described by the circumference of the wheel round its axis,) is represented by the product $2\pi\rho N$. So that,

$$2\pi\rho N = \int_{\theta_2}^{\theta_1} f(\theta) \cdot d\theta$$

Let now a contrivance be applied to the instrument for registering the revolutions N of the frame Q R K L, and therefore of the integrating wheel S P, to the 1,000th part, or to four places of decimals. This registration may be made by the common method of astronomical instruments; or more conveniently, and perhaps with sufficient accuracy, by means of toothed wheel fixed on the axis of the frame, and running into a pinion in the proportion of 10 to 1; this pinion carrying a wheel which runs into a second pinion in the same proportion, and so on through a train of wheels and pinions, each wheel of which being divided into 10 equal parts, and numbered, will show one digit of the decimal part of a revolution up to as many places of decimals as there are wheels. The complete revolutions of the frame may in like manner be registered by means of a pinion on the axis of the frame running into a wheel in the proportion of 1 to 10. The value of N may thus be registered to four places of decimals probably with accuracy.

As an illustration of the application of this principle, let us suppose e f a straight line, or rather a curve, so slightly deviating from a straight line, as to give to the point P of the integrating wheel the same motion as that point would receive from a straight line fixed upon the revolving plate, and actually passing through that point. Then if a represent the perpendicular distance of this line from the point C, and θ the inclination of that perpendicular, in any position of the plate to the line C P,

$$C P = f(\theta) = a \sec \theta$$

$$\therefore 2\pi\rho N = a \int_{\theta_2}^{\theta_1} \sec \theta \cdot d\theta$$

This is an example of the definite integration, by means of the instrument, of a function integrable also by the ordinary methods; the integral in the second member being, as is well known, represented by the function,

$$\log \left\{ \frac{\tan \left(\frac{\pi}{4} + \frac{\theta_1}{2} \right)}{\tan \left(\frac{\pi}{4} + \frac{\theta_2}{2} \right)} \right\}$$

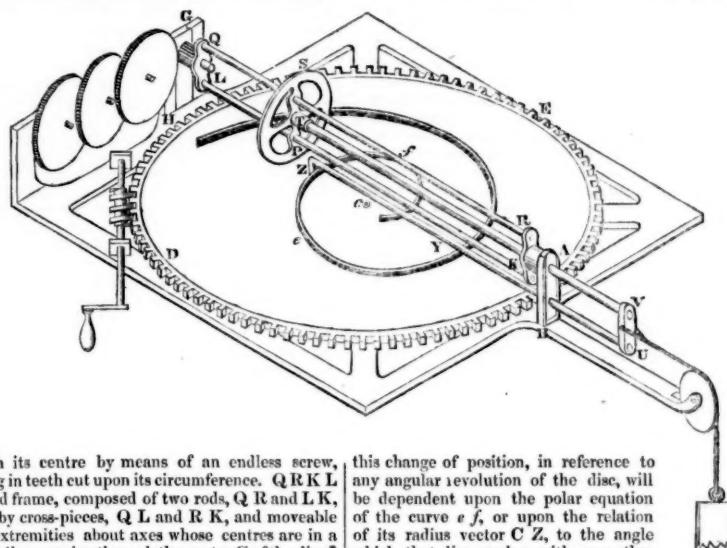
Whence it follows, that if a had been taken such that

$$\frac{a}{2\pi\rho} = 43429, \text{ then would}$$

$$N = \log_{10} \left\{ \frac{\tan \left(\frac{\pi}{4} + \frac{\theta_1}{2} \right)}{\tan \left(\frac{\pi}{4} + \frac{\theta_2}{2} \right)} \right\}$$

* See Poisson, Journal de l'École Polytechnique, 18me cahier, p. 320; or Art. 2 in the Treatise on Definite Integrals, in the Encyclopédie Metropolitana, by Prof. Moseley.

† The train of wheels is, by mistake, shown in the wrong order in the figure; instead of a pinion fixed on the revolving frame running into a wheel, it should have been a wheel running into a pinion, and so on.



through its centre by means of an endless screw, working in teeth cut upon its circumference. Q R K L is a rigid frame, composed of two rods, Q R and L K, joined by cross-pieces, Q L and R K, and moveable at its extremities about axes whose centres are in a straight line, passing through the centre C of the disc. The axis, A, of this frame is hollow, and there passes through it a rod, V T, at the extremity of which is a wheel, S P, which, from the peculiar functions assigned to it in this machine, is called the *Integrating wheel*; the wheel is moveable about the extremity of the rod V T, but is confined to it by means of a nut, and it has holes in two of its arms, through which the rods Q R and L K of the frame pass, fitting them accurately. The axes of the frame turn in bearings, which are not fixtures to the frame of the instrument, but which slide vertically by means of grooves in the fixed pieces A B and G H. The weight of the frame and of the wheel S P is thus made to rest entirely upon the point of contact, P, of the edge of the wheel with the disc D E, and any amount of friction of the two surfaces of contact, may be obtained by sufficiently loading the frame. The rod T V is connected by means of a vertical piece, V U, with a second similar rod, U Z, at whose extremity, Z, is a short vertical piece reaching to the surface of the disc, and kept pressed against the curved edge or rail e f (which is screwed down upon the plate, and is of any given geometrical form), by means of a cord attached to the cross-piece V U, and carrying a weight. It is evident from this construction that, if the curve e f be any other than a circle, having its centre in C, the wheel S P will be made to alter its position on the frame Q R, and the point P its distance from the centre C, by the pressure of the edge e f, when the disc or plate D E is made to revolve by the action of the screw; and that the geometrical law of

this change of position, in reference to any angular revolution of the disc, will be dependent upon the polar equation of the curve e f, or upon the relation of its radius vector C Z, to the angle which that line makes with any other similar line given in position in it. Now let it be conceived that such a form is given to the curved edge e f, as to cause the distance C P of the point of contact P, of the circumference of the wheel S P, from the centre of the disc, which distance differs very little from C Z, to be a given function $f(\theta)$ of the angle θ described by the disc D E, and let it be observed that, as the wheel S P is made to traverse the frame Q R, by the pressure of the edge or rail e f; this wheel is also made to revolve by its friction upon the plate at P, that friction being produced by the pressure of the weight of the wheel and of the frame Q R upon the plate, which pressure, if it be not sufficient for the purpose, may be increased in any proportion. The wheel S P thus continually varying its distance from the centre C of the plate, and its circumference continually revolving with the velocity of that part of the circumference of the plate with which it is then in contact, it follows that the number of revolutions, and parts of a revolution, which is made by it, and therefore by the frame Q R, which it carries with it, as the plate revolves from any given angular position θ_1 , to any other, θ_2 , is a function of the form and dimensions of the curve e f, represented by the definite integral—

$$\int_{\theta_2}^{\theta_1} f(\theta) \cdot d\theta$$

for the distance C P, being represented in any position of the plate by $f(\theta)$, it is evident that, whilst the exceedingly small but finite increment $\Delta\theta$ of the angle θ , is described by the plate about its centre, the point P in it describes an arc represented by $f(\theta) \Delta\theta$; so that, if, in any position of the integrating wheel, its distance from C be supposed to remain

* Prof. Moseley here stated that the drawing had been made from a very general description of the instrument, and that it would be desirable in several respects to alter it in actual construction.

or if the registration had commenced from that position of the plate, where the perpendicular α coincides with CP ; so that $\theta_2=0$; then

$$N = \log_{10} \left\{ \tan \left(\frac{\pi}{4} + \frac{\theta_1}{2} \right) \right\}$$

So that, when an edge or rail of the form here supposed, is screwed in this position upon the plate, the instrument may be made to supply the place of a table of logarithmic tangents; and in like manner might the logarithmic sines and cosines of angles be given by the instrument, the proper form of the curve ef being in each case assumed.

Let the curve ef now be conceived to become a circle, whose circumference passes through C , and whose radius is represented by α , then will the polar equation to this curve from C , be represented by $r=2a \cos \theta$, the angle θ being measured from the diameter passing through C . In this case, therefore,

$$N = \frac{a}{\pi \rho} \int_{\theta_2}^{\theta_1} \cos \theta \, d\theta$$

or if the inferior limit θ_2 be zero, and α be taken $= \pi \rho$, then

$$N = \sin \theta.$$

This curve being therefore placed upon the *disc*, the instrument may be made to supply the place of a table of *natural sines*, and by analogous contrivances, to serve as a substitute for tables of *natural cosines*, *tangents*, &c.

Again, let us suppose ef a curve slightly differing from an ellipse, whose centre is in C , and such that the point P of the integrating wheel may be made to move as it would if guided directly and continually by the actual pressure of an elliptic edge fixed upon the plate, and having its centre in C . Let b represent the semi-axis minor of this ellipse, and a its eccentricity; also let θ represent the inclination of CP to the axis minor of the ellipse in any position of the plate, then by the polar equation to the ellipse about its centre—

$$CP = f(\theta) = \frac{b}{\sqrt{1 - e^2 \sin^2 \theta}}$$

$$\therefore 2\pi\rho N = b \int_{\theta_2}^{\theta_1} \frac{d\theta}{\sqrt{1 - e^2 \sin^2 \theta}}$$

If the inferior limit θ_2 be zero, and b be taken, so that $\frac{b}{2\pi\rho} = 1$, N represents an elliptic function of the first order, whose amplitude is θ , and modulus e . A series therefore of such elliptic curves as ef , screwed upon the plate, would make it a substitute for a table of elliptic functions of the first order; and an easy adaptation of these would probably extend its calculations to the second, and probably to the third, order of elliptic functions.

Again, let the curve ef be a logarithmic spiral, whose pole is C . Let γ be the constant angle, which the radius vector of this spiral makes with its tangent, and α any radius vector given in position, from which the angle θ is measured. Then by a well-known property of this spiral,

$$CP = f(\theta) = \alpha e^{\theta}$$

$$\therefore 2\pi\rho N = \alpha \int_{\theta_2}^{\theta_1} \theta \cot \gamma \, d\theta = \alpha \tan \gamma \left(\theta_1 \cot \gamma - \theta_2 \cot \gamma \right)$$

If the inferior limit θ_2 be assumed equal to zero, or the number N be assumed to commence in that position of the plate in which the given radius vector α coincides with CP , then

$$N = \frac{\alpha \tan \gamma}{2\pi\rho} \left(\theta_1 \cot \gamma \right)$$

Let now α and γ be so taken, that $\frac{\alpha \tan \gamma}{2\pi\rho} = 1$ and

$$\cot \gamma = 10 \quad \therefore N = 10 - 1$$

θ_1 is, therefore, the common logarithm of $N+1$. And if, connected with the endless screw which gives motion to the plate, there be a train of wheels registering the space described by a point in the plate, at distance unity from its centre to three or four places of decimals, and the plate be made to revolve

from the position in which the given radius vector coincides with CP into a position in which the index of the first register shows any No. N , then will the second or last-mentioned register show the logarithm θ_1 of a number one greater than that. So that by this adjustment of the apparatus, it may be made to replace a table of ordinary logarithms. It would be better, however, with a view to this application of it, to replace the plane disc DE , by the surface of a cone. The requisite spiral would more readily be traced on the surface of such a cone; it is identical with the *natural spiral*, traced out by the convolutions of a large class of turbinated shells.* Under this form the instrument might be brought into a comparatively small compass; and it is not difficult to see that by a mechanical combination of no great complexity, it might be made to add or to subtract the logarithms which it registers, and to record the numbers which correspond to the logarithmic sums or differences which it thus obtains, completing in this process the mechanical operations of multiplication and division in respect to numbers of any number of digits. The only examples hitherto given of the calculation of this machine, are examples which lie within the compass of the ordinary methods of analysis; and in respect to these, the instrument could only serve to *replace*, perhaps conveniently, but less accurately, well known processes of analytical calculation or tables already formed. There is, however, a large class of functions, whose analytical integration lies beyond the existing resources of mathematical science, the *MECHANICAL INTEGRATION* of which this machine will nevertheless readily effect. The accuracy of the results it gives in respect to these, being dependent upon the same principles as the accuracy of the results it gives in respect to the others, and, therefore, verified by a comparison of these last results with the tables. It is impossible, in this popular and hasty discussion of the subject, to enter at any length, or with any system or method, on the consideration of this class of integrals, and the resources of mechanical integration, which the machine offers in respect to them. One or two examples, however, present themselves readily. Let us suppose that the logarithmic spiral is applied to the plate, but instead of having its pole coincident with the axis C , let it be in some other point, whose distance from C is represented by b , and let the given radius vector from which θ is measured pass from the pole of the spiral through C . Call R the radius vector to any point of the spiral from its pole, and r that from C , and let θ be the angle corresponding to the first, and θ to the second. Then the following relations will readily be seen to obtain between the quantities R , r , θ , θ :

$$\begin{aligned} \theta \cot \gamma \\ R = a \epsilon \\ r^2 = R^2 - 2 R b \cos \theta + b^2 \\ \sin(\theta + \theta) = \frac{b}{r} \end{aligned} \quad \left. \begin{aligned} \theta \cot \gamma \\ R = a \epsilon \\ r^2 = R^2 - 2 R b \cos \theta + b^2 \\ \sin(\theta + \theta) = \frac{b}{r} \end{aligned} \right\}$$

By the elimination of θ and R between these three equations, r will be determined under the form of an implicit function of θ , completely insoluble by any known methods of analysis in respect to that variable; and could it be solved, yet must it evidently be presented under the form of a function of θ , whose integration in respect to that variable by any known methods of analysis is impracticable; yet will the machine at once complete the definite integration—

$$\int_{\theta_2}^{\theta_1} r d\theta$$

r being the complicated implicit function of θ , exhibited by the above equations. As another example, let us suppose the curve ef to be that generally known as the logarithmic curve, whose equation in respect to the rectangular co-ordinates x and y is $y = a^x$. Let the origin of the curve be in C , then is the polar equation to this curve from that point

$$r \cos \theta = a$$

* This property of turbinated shells was first published by Prof. Moseley, in a paper on the Geometrical Forms of Turbinated and Discoid Shells, in the Phil. Trans. for 1838. It has since been confirmed by the accurate measurement of Prof. Naumann, of Fribourg, published in the Journal of Poggendorff. The exact sciences are thus at length introduced into the region of Natural History under the form of a science, to which Prof. Naumann has given the name of *Conchilometry*.—ED.

where r is an implicit function of θ inextricable under any finite form. Yet is the numerical value of the definite integral

$$\int_{\theta_2}^{\theta_1} r d\theta$$

for any values of the limits θ_1 and θ_2 yielded by the ordinary operations of the machine. Among the mechanical difficulties which present themselves to the construction of such a machine are the following. Great accuracy will be required in giving their true geometrical forms to the curves fixed upon the revolving plate. It is unquestionable that a certain amount of error must always remain due to inaccuracies of workmanship in the forms of these curves; nevertheless to those who are acquainted with the wonderful education of the sense of touch and the skill of hand acquired in the minute workmanship of some processes of the arts (the engraving of type-founders' dies for instance, or the drawing of micrometrical lines on glass, many of the comb movements of machinery, and the admirable tools of Mr. Whitworth,) it will not appear impossible to reach with the requisite care and patience a very considerable degree of precision in this respect; and let it be remembered, that one type or model being thus attained, it may be reproduced indefinitely, and with perfect accuracy, by casting in type-founder's metal, or perhaps by turning or by the electrolyte. Again, the difficulty of constructing these curves will, no doubt, in some degree be enhanced by the fact, that the guiding curve ef must be different from what it would be if the points Z and P coincided. This difficulty (not in itself considerable) may, however, wholly be removed. We have only to take the curves from the plate DE , and to place them on another circular plate parallel to and concentric with DE , of precisely the same dimensions, but so far above it as to clear the integrating wheel SP ; and then to give to the connecting piece VU a direction upwards instead of downwards, so that the bar UYZ may pass to the superior surface of the upper plate; if this bar be then precisely of the length of the arm VT , the point P will be made to describe a path on the lower plate precisely similar to that of the point Z on the upper. And let it here be observed, that there are some important applications of the instrument, in which the curve ef admitting of an easy mechanical description, the guidance of a rail may be entirely dispensed with, the point Z being made to vary its position according to the required law, by some more convenient or more accurate mechanical expedient. In conclusion, let it be observed, that since by milling the edge of the integrating wheel SP , by making the plate DE of a soft metal—brass, for instance, or perhaps zinc—and by loading the frame, any degree of friction of the surfaces at P may be obtained; and by increasing the diameter of the wheel SP , any leverage of that friction to turn the machinery connected with the frame, it would be quite practicable to introduce those mechanical expedients into the train of wheels which are necessary to cause the digits of the numbers registered to arrange themselves *side by side* in line; and that then, by uniting with it the admirable combinations of Mr. Cowper's Printing Press, the machine might be made to print off the results of its calculations, precisely as by the same press the successive numbers are made to print themselves upon bank notes.

Prof. WHEWELL then gave a further account of Mr. Ross's discussion of Tide Observations at Leith, but stated that the inquiry was still imperfect, and the results unsatisfactory, and that he should therefore, at some future meeting, bring the subject again before the Section.

Mr. Fowler's account of his Calculating Machine was now to be brought before the Section, according to the order of the list prepared by the Committee, but it was found that by mistake the machine had been put up at the Naval Annuity Office, Devonport; an arrangement was therefore made, that as many members as felt an interest in the matter should meet next morning at 10 o'clock, at Devonport, when Mr. Fowler and the Secretary of the Section would attend, and the machine should be explained in detail.

Mr. BOWMAN 'On determining distances by the aid of the Telescope.'—The principle of this proposal was to observe the number of divisions of a graduated

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staff placed at a distance; and considerable ingenuity is shown in determining the distance, by making necessary corrections on this observed number. The author thinks his method would be more accurate in surveying, than the actual measurement by the chain, particularly in uneven ground; and asserts that the error in taking any distance could not exceed the ~~one~~ part of the entire distance; hence, by dividing the entire distance, even when large, into a number of parts, he conceives great precision would be attained.

Mr. GRELLÉT gave an 'Account of an Instrument for Drawing Circles in Perspective.'

The following letter did not arrive until the Section had finally closed its sittings. Few, therefore, of the members had an opportunity of seeing the very beautiful coloured copies referred to, taken by the photographic process.

Collingwood, Hawkhurst, Kent,

July 31, 1841.

Sir,—Allow me to request that you will submit to the inspection of the Physical Section of the British Association, the annexed specimens (fifteen in number) of coloured photographic copies of engravings and mezzotintos, into the preparation of which no metallic ingredient enters, the whole being tinted with substances of vegetable origin variously prepared. The rays of the spectrum which have eaten away the lights in these photographs, are neither the so-called chemical rays beyond the violet, nor the calorific rays beyond the red. The action is confined almost entirely to the luminous rays, and of these more especially to those rays of the spectrum whose union forms a colour complementary to that of the ground-tint, a circumstance which, considering the great command of colour which this new variety of the photographic art affords, holds out no slight hope of a solution of the problem of a photographic representation of natural objects in their proper colours. Unwilling to occupy the time of the Section so near its conclusion, I pretermit for the present, all details of manipulation, and remain, Yours, &c.,

J. F. W. HERSCHEL.

SECTION B.—CHEMISTRY AND MINERALOGY.

'On the Radical of the Kakodyle Series,' by Prof. Bunsen.

The method recommended as the easiest for preparing kakodyle in a pure state is the following:—chloride of kakodyle, carefully freed from the oxide by treatment with strong muriatic acid, is allowed to stand some time over chloride of calcium and quick lime, to remove the water and all excess of acid. It is then introduced into a distillatory apparatus carefully filled with carbonic acid, and containing some slips of clean sheet zinc. Any of the metals which decompose water will answer, but zinc is the best. It is probable that hydrogen or carbon would produce a similar decomposition with suitable modifications of the apparatus. The vessel is then hermetically sealed, and the mixture of zinc with the chloride is exposed in a water bath to a temperature of 212° Fahr. for some hours. When the decomposition is complete, a white saline mass is formed, which melts into an oily liquid between 240° and 238° Fahr.; while the tube is still hot, the point of the tube leading into the condenser is dipped below the surface of boiled distilled water: as the apparatus cools, the water rises into it. The tube is hermetically sealed; the water dissolves chloride of lime, leaving the excess of zinc and the *kakodyle* which falls as an oily liquid to the bottom,—this is rectified twice or three times in vessels filled with carbonic acid as before; the water being afterwards removed by chloride of calcium in the usual way. Thus obtained, it is a colourless liquid, transparent and of a high refractive power, in appearance and odour much resembling the oxide of kakodyle, and ignites instantly on being brought in contact with air, giving off water, and carbonic and arsenious acids.

'On the Production of Sulphuretted Hydrogen by the Action of Vegetable Matter on Solutions containing Sulphates,' by E. Lankester, M.D.

Dr. Lankester stated that observation had enabled him to detect sulphuretted hydrogen in water, by the presence of some peculiar animalcule which caused a red deposit—he found it in lakes and springs near Askerne, in the dropping well at Knaresborough, and other places situated on or near the great tract of

magnesian limestone in that district. He then enumerated a series of experiments, instituted with a view of investigating the source of sulphuretted hydrogen, from which he came to the conclusion, that it arose from the decomposition of the sulphates, in contact with vegetable matter. In allusion to Prof. Daniell's experiments on the waters from the African coast, the author stated, that Dr. Clem has recently detected sulphuretted hydrogen to a very considerable extent in the sea waters of the British coast. Dr. Lankester is of opinion that the elements for the production of sulphuretted hydrogen are as abundant around our own island, as on the coasts of Africa; but it is not developed to so great an extent from the want of a high degree of heat.

Dr. DAUBENY remarked, that running water soon lost its sulphuretted hydrogen, and the converse grew at Knaresborough immediately the waters were, by exposure, freed from this gas, thus distinctly marking its presence or otherwise.—Mr. ROBERT HUNT stated, that he had detected sulphuretted hydrogen in considerable quantities, in the water issuing from the clay slate of the bottom level of the Consols Mines, and also in some other samples of water collected in the deep Cornish mines.

A paper was read from Dr. R. D. Thomson, 'On the Composition of Crystallized Diabetic Sugar.'

Mr. Boor made a communication on the subject of Spontaneous Combustion.—The author enumerated a great variety of vegetable and animal products which possess the property of passing spontaneously into combustion. He also exhibited a table showing the number of fires occurring in London in a given time, particularizing the different trades, and where it was possible to obtain the information, and causes of these fires.

The destruction of the *Talavera* being mentioned, Mr. ROBERT HUNT stated that he had been engaged, at the request of the solicitor to the Admiralty, in the inquiry which followed this fire, and had forwarded to the Admiralty two Reports, which, to his own mind, most satisfactorily referred the fire to the spontaneous ignition of masses of oiled oakum, anti-attrition, oiled and painted canvas, sawdust, &c., which had been allowed to accumulate in a large bin, on the edge of the dock, immediately beneath the roofing under which the ship lay.

Mr. N. HEARDER adverted to the spontaneous explosion of iron bomb-shells, instances of which had recently occurred, and mentioned some experiments which he had performed a few years since on combustion in *vacuo*, but which, in consequence of an accident which deprived him of sight, he found himself incapable of continuing with accuracy. They related to the effect of diminished pressure in modifying and restraining combustion. The following are some of the experiments which he detailed:—Different mixtures of chlorate of potash, with loaf sugar, sulphur, arsenic, black sulphuret of antimony, &c., were successively introduced into the receiver of an air pump, together with a small vessel of sulphuric acid. The receiver was exhausted, and, by means of a sliding wire through the cap, a bunch of thread was made to touch first the sulphuric acid, and then the chlorate mixture, but in no case could any combustion be effected. A slight effervescence, and, in the dark, very faint scintillations of light were perceived. The experiment was reversed, by throwing the mixtures into the acid, but without combustion. Into a champagne glass about one ounce of nitric acid was poured, and a few grains of chlorate of potash and phosphorus were then thrown in; in a few seconds brilliant flashes of light were produced under the acid; but on placing the glass under a receiver, and exhausting, the flashes ceased after a few strokes of the pump. On re-admission of the air the flashes again appeared, and so on alternately. In order to vary the experiments, Mr. Hearder contrived to keep a piece of platina wire in vivid ignition by a powerful galvanic battery, which, when the receiver was exhausted, was brought into contact with gunpowder, but without its being inflamed. The portions in contact with the wire fused and adhered to the wire, and were seen in a state of ebullition at a red heat on the wire, and appeared gradually to evaporate. During this process a dense brown smoke was observed to fall at the bottom of the receiver. Air was then admitted, and as soon as the barometer gauge indicated half the pressure of the atmosphere, the gunpowder inflamed with

a very faint flash. The experiment was repeated, but nitrogen gas was admitted instead of atmospheric air, and the inflammation took place when one-fourth of the capacity of the receiver was admitted. A mixture of chlorate of potash and arsenic inflamed on re-admission of air, when the mercury had fallen two inches. Chlorate of potash and sulphuret of antimony required the admission of a much larger proportion of air to produce inflammation. Whatever combustible mixtures were used, the inflammation was always effected with the admission of a much less quantity of nitrogen than of atmospheric air. In experiments with antimony and arsenic, iron wire was used, instead of platina, the latter being always destroyed by the inflammation of these substances. Mr. Hearder considers that the restrained action thus observed arises from the extremely attenuated form which the gaseous matter assumes at the moment of its formation, since it must necessarily expand over the whole receiver, by which means its concentrated action upon the other ingredients is prevented.

Mr. PRIDEAUX exhibited a specimen of a compound of oxide of lead with empyreumatic oil, produced in the distillation of wood, and forwarded by Mr. A. Tunstall, of Neath.—This compound, which had much the character of diachylon, was entirely soluble in boiling water, from which sulphuric acid separated the lead, and the oil floated on the surface.

Mr. TWEEDY mentioned, that about six months ago, a specimen was shown to him by a respectable mineral dealer at Truro, of what he called molybdc silver. As, however, it was of a very fusible character—melting before the blowpipe readily, even in the flame of a candle.—Mr. Tweedy conceived that bismuth must enter largely into its composition, and sent a small specimen to Mr. Prideaux for examination, who ascertained that it was nearly pure bismuth, he believed native. Some further specimens satisfied Mr. Tweedy of its being natural, and not artificial, and of its great value. It was found in a mine near Truro, in a large unproductive sparry lode, and only in one spot.

SECTION C.—GEOLOGY AND PHYSICAL GEOGRAPHY.

Major S. CLERKE called attention to the 'Atlas of Sieges and Battles in the Peninsula,' published by Mr. Wyld, and constructed from original sketches taken under the direction of Sir George Murray, by Sir Thomas Mitchell, now Surveyor-General of New South Wales. Major Clerke explained the origin and character of these plates, which he designated as a noble specimen of military topography.

—Mr. H. E. STRICKLAND communicated to the Section a map of Santorin, about to be published by Prof. Ritter, of Berlin. It is engraved from a survey of the island made by Capt. Gineste, officer of the French expedition in Northern Greece.

'Account of the Strata penetrated in sinking an Artesian Well at the Victoria Spa, Plymouth,' by Dr. Edward Moore.

The author pointed out the mode by which the operations were conducted. The strata penetrated were as follows:—Earthy clay slate, 20 feet; limestone, 150; blue slate, 20; red sandstone, 3; red slate, 37; limestone, 50; sandstone, 4; red and blue slate, 30; dunstone, 8; earthy clay slate, 20; red sandstone, 12; making a total of 365 feet. The earthy slates were of the character of those generally found under the limestone, but they were interspersed with blue shillat slates, similar to those which occur above it. From the circumstance of the slate rocks immediately below the red sandstone being in each instance tinged red, the author imagined that their colour might in these cases, if not in all, arise from the iron of the red bands affecting them by percolation. He next remarked that from the alternations of slate and limestone, the former appearing, from a consideration of the section, to come up in wedges through the latter, it might be possible that the opinion that some of the Plymouth limestones might have been formed in a manner analogous to the modern coral reefs, was founded on correct data, although in many other localities in the vicinity the bands belong to the same uninterrupted series of deposits. The quantity of water obtained was at first considerable, and overflowed the pipe; at present it generally remains about two feet below the surface, from whence it is carried to the saloon by a pump; it is clear and sparkling,

and of a saline taste; it has been examined by Professors Faraday and Daniel, and found to contain in the imperial pint 8,100 cubic inches of carbonic acid gas, and 151.66 grains of dry salts, thus:—

Chloride of Sodium	96.64
Muriate of Magnesia	18.63
" " Lime	15.10
Sulphate of Soda	9.55
" " Lime	8.94
Carbonate of Lime	2.06
" " Iron	0.69

151.66

Its specific gravity at 62° is 1013.3.

Prof. SEDGWICK, after reviewing the general principle of artesian wells, described two districts in which these operations were attended with very different results. In the eastern part of Essex the chalk is covered by sandy beds of the plastic clay, and these by several hundred feet of impervious strata of London clay, all dipping together towards the east. The arenaceous beds below the London clay rise higher towards the chalk than the clay does, and absorbs a considerable part of the water from the high grounds. By boring through the clays to this sand, springs of water immediately rise above the surface, and are carried off by natural channels. By this supply of water, the value of the land has been materially increased, since the country, though abounding in peat bogs, and stagnant ponds during winter, suffers much from the summer drought. The other attempts to form artesian wells, referred to by Mr. Sedgwick, were made near Lincoln, which, though surrounded by fens, covered with water in the winter, is not sufficiently supplied during the summer. But the clays supporting the fens of the Bedford Level are below the chalk, and though there are pervious beds beneath them, which rise to the north-west, yet the clays are of such enormous thickness that they have never been penetrated; and even were that accomplished, the high land is so distant that intervening fissures, filled up with impervious materials, might intercept the supply. Expensive sinkings have been made at Lynn, and also at Boston, and after boring through many hundred feet of clay they have utterly failed, and in any future operations in this district the chance of success would be very remote. Mr. Sedgwick then observed with respect to the red colour of rocks mentioned by Dr. Moore, that he considered it simply owing to the red oxide of iron which might be present or not in any bed; sometimes the tinge was only superficial. In Nassau the red colour was owing to vicinity of trap rocks. He also observed, as to the condition of limestone rocks, that although they sometimes appear in masses, presenting a brecciated appearance, shells and broken corals being cemented together, yet generally they occur as regular parts of the series repeated without any regularity, in formations of all ages. In position and inclination they resembled their associated rocks, and partook in all their contortions and dislocations, except so far as their solid masses would resist mechanical movements, better than yielding deposits of sediment and mud. The organic remains found in limestones only differed from those in the other beds of the same age as far as the conditions differed under which each was deposited. At the present day different families of corals grow upon a solid and a soft bottom. The Rev. W. D. CONYBEARE pointed out the similarity between artesian wells and mines sunk in the coal measures. Artesian borings had been made with success near the outcrop of certain strata, but at a distance from this, although the combination of strata was the same, they had failed, from the great depth necessary to be penetrated. Now it is certain that the coal exists in many places beneath the new red sandstone and magnesian limestone, but at such depths that it would be hopeless to attempt to reach it. He therefore recommended to the attention of miners the formation of a series of artesian borings in some of the coal districts, beginning where the probability was greatest, and proceeding from that point till the depth became too great. Such a series of experiments would show the nature and depth of the strata below, and over what extent coal might be worked without sinking shafts at enormous expense and with the risk of complete failure. Mr. BARTLETT observed, in confirmation of one of Dr. Moore's remarks, that where limestones abounded in corals, as at Berryhead, their structure was homogeneous, and exhibited little trace of stratification;

when the corals were rare, the bedding became distinct.

Dr. BUCKLAND desired to state more explicitly the opinion he had given on Friday, with respect to the construction of breakwaters, &c. of limestone.—Upon further inquiry he was inclined to believe the ravages of the Pholas and Saxicava did not extend to any great depth, but were chiefly confined to the interval between high and low water-marks. The length of time requisite to destroy a work of considerable extent by such means would probably render it still advisable to use limestone where it could be obtained with facility, since it would be better to rebuild once in five hundred or a thousand years than go to the immediate expense of employing granite. Dr. Buckland then exhibited a series of specimens from Lord Morley's granite quarries, in Prince Town, Dartmoor. To the depth of fifty or sixty feet the granite is more or less decomposed, and this *surface granite* has been employed in almost all cases, because it was obtained cheapest; and the result has been, that in all buildings which have stood for any number of years, such as the Dartmoor prison, each block of granite has become a spongy mass, absorbing moisture continually, rusting the iron bars employed in combination with it, and rendering the cells so damp that they can only be used by covering the walls within and without with Roman cement or tiles. This defect is inseparable from all the granite which is not quarried from a depth beyond the influence of decomposition. At the bottom of the Morley works a mass of granite is exposed to a great extent, and entirely free from this influence; it is from this the granite is obtained now being used for Lord Nelson's monument in Trafalgar Square. Dr. Buckland also exhibited specimens of granite containing tin, and a mass of amethystine quartz, from Dartmoor. He next described the quarries and potteries at Shaw, seven miles north of Plymouth. The surface, over hundreds of acres, consists of decomposed feldspar, in a state resembling flour; this is purified by passing streams of water over it, and when baked it forms a fine porcelain, from which ornamental figures, &c. may be made. Specimens of the decomposing feldspar, and the porcelain prepared from it, were exhibited by Dr. Buckland; also fire-bricks made from the refuse of the tin ore, which did not suffer like those ordinarily employed by being used in the furnaces for black bottle-glass; and waterpipes, precisely like those made by the Romans and discovered uninjured at Stonefield and at Palermo, showing they will last two thousand years, combining this advantage, that the water conveyed by them would not be charged with ferruginous matter, as in the iron pipes.

Dr. MOORE exhibited a collection of the fossils just discovered in some of the slate rocks.—Mr. S. P. PRATT exhibited specimens, supposed to be from the black slate overlying the limestone of Mount Batten; they were derived from blocks lying on the beach close to the black shales; one piece was in contact with the bed containing encrinites. They contained several species of plants and scales of fish.—Mr. PHILLIPS observed, that the slates of Bovisland and the neighbourhood, where these scales were found, was far removed above the Plymouth limestone: the scales appeared to be those of the Holoptichus and Palaeoniscus of carboniferous and old red sandstone deposits. The Palaeoniscus occurs chiefly in the upper carboniferous limestone, and extends to higher beds; two forms of its scales, the smooth and ornamented, were in Mr. Pratt's specimens, and both are found in the carboniferous system. The shales were so similar to those of Manchester that actual comparison would not serve to distinguish them.

Mr. DAWSON exhibited a model of the Great Landship of Axmouth, which took place at Christmas, 1840. It was constructed on a scale of 120 feet to the inch, and represented a mile and a quarter. According to Mr. Dawson, the length of the chasm caused by this subsidence was 1,000 yards, the breadth 300 yards, and the depth 130 to 210 feet; 22 acres were sunk in the chasm.

The Rev. W. CONYBEARE, and afterwards Dr. BUCKLAND, described the general nature and particulars of the landship (vide *Athenæum*, No. 654). The strata at Axmouth consist of chalk resting upon extremely sandy beds of "foxmould" or upper green-sand, and the beds dip towards the sea. The ex-

tremely wet winter of 1840 reduced these lower beds to a quicksand, which at length gave way, and let down a part of the cliff above; part settled forward and part downwards, forcing up, by its pressure, a bank of sand in the harbour, twenty or twenty-five feet above sea level; the bedding of this forced up mass was stated to be in a contrary direction to that of the cliffs.—Mr. WHEWELL stated that apparently no tremor causing a change of level in the land near the landship had taken place, for a person had been sent to examine the block of granite placed at Axmouth, to register the level of the tides, and had no change, even of the twentieth of an inch, taken place, it would have been observed.—Mr. DE LA BECHE observed that the landship appeared to have taken place along a small line of fault known before to have existed there.

Major HARDING read a notice of the discovery of some fossils on Great Hangman Hill, near Combemartin, North Devon.—They consist of shells in the form of casts, and appear in large detached and ferruginous masses of quartzose rock, ranged on the surface. Major Harding has also observed a similar formation in the Valley of Rocks, near Linton.

Prof. SEDGWICK observed that fossils had not before been found in this locality; they were considered the same as the fossils in the upper Ludlow rock. But they were found in the lowest part of the Devonian system, all the old red slates being above them; the fact therefore of finding upper Silurian fossils near the base of the Devonian system only proved that in Devon there was no good line of separation between the systems. When Mr. Sedgwick and Mr. Murchison examined the country, in 1836, they were led, chiefly by mineral structure, to consider the highest groups of North Devon identical with the Caradoc sandstone: the beds further north, which dip under these, were found to contain fossils of the old red sandstone, which led them to suppose it was a grand case of *boulversem*. In 1838, Mr. Sedgwick again examined the district, and finding there was no reversal, was obliged to relinquish the idea of the identity of the higher groups with the Caradoc sandstone, and refer them to the parallel of the upper old red sandstone. Mr. Lonsdale's examination of the fossils of the Plymouth limestone having determined its intermediate position between the carboniferous and Silurian systems, the whole system of rocks in North and South Devon were regarded, on zoological evidence, as newer than the Silurian system and older than the carboniferous; the exact lines of demarcation between these systems not being finally settled. Mr. Sedgwick then alluded to the difficulty he and Mr. Murchison had experienced in drawing a line between the Cambrian and Silurian systems. The Llandeilo flags would have formed a good basis for the Silurian system, but they were not persistent, yet the want of a good base line does not destroy the value of the details which Mr. Murchison has collected. A similar difficulty occurs in descending below the carboniferous limestone: certain typical forms appear and disappear, one series melting into another, so that no group can be entirely different from those above and below; but this circumstance, though it makes the divisions of strata more difficult, does not make them less real. One general conclusion becomes very apparent—wherever we meet with rocks admitting of the preservation of organic remains, the number of these decreases as we descend in the series, till we arrive at a period when the physical monuments of the globe bear no trace of organized beings, an abyss which gives no record of life, and sets a bound to our zoological inquiries. But the researches of the geologist do not stay here; it still remains for him to investigate changes connected with great moving forces, with galvanism, and with polarity, manifested in cleavage, and joints, and all the other problems connected with the primary rocks; and these inquiries Prof. Sedgwick believed would in future form one of the most important parts of geological investigation.

Mr. J. C. BELLAMY exhibited a collection of Devonian fossils, containing about 150 species, and a printed table of genera, showing the various localities in which they were obtained; he stated the relative abundance of groups of fossils in these rocks, as occurring in the following order: Polyparia, Crinoidea, Conchifera, Cephalopoda, Gasteropoda, and Crustacea.—The Rev. W. D. CONYBEARE pro-

posed the term "Epi-Silurian" for these formations, which, he observed, could not be called "old red sandstone" in Devon, or "Devonian" in Herefordshire.

Prof. PHILLIPS first discussed the general nature of the problem involved in determining the age of the Devonian strata, and compared them with other systems of strata whose relative position had been fully made out,—showing that, both by mineral character and structure, and sequence of individual rocks, the strata of Devonshire could be confidently ranged among the older assemblages of rocks, but were not referable to their exact age, or place in the general scale of geological time, by characters derived from these considerations. Mr. Phillips next proceeded to examine the value of zoological evidence. Seeing that as the fossils of any series of strata were found in deposits, which have in succession formed the bed of the ancient sea, and are therefore to be received as the monuments of successive combinations of life, the question arose, what was the character of organic life in each of these periods? These remains of life are most plentiful in the upper strata, decrease in number and variety as we proceed downwards, and, by gradual and continual diminution, approach in the lowest to absolute extinction. In the Devonian rocks more than 300 forms are now known; and from the abundance of materials not yet examined we may expect to raise it to 500, a number greater than that yet found in the Silurian system. Turning from the consideration of numbers to another mode of comparison, we may study the prevalent forms of organic life, characteristic of successive periods. Nature is always consistent in the inorganic and living parts of creation, and the combination of organic remains was not the same when the earth was under different conditions from the present. The predominant mollusca of the ancient sea were not of the same type as the present. The Cephalopoda and Brachiopoda, now comparatively rare, were abundant and various in the ancient beds; but Polyptaria abound in all strata where the necessary conditions seem to have existed. Having ascertained the combinations which characterize groups of the older strata, the general result of a comparison between the Devonian rocks and the Silurian and carboniferous systems would give them an intermediate position between the combination of life in the Silurian period and that in the carboniferous; and Mr. Phillips considered the evidence derived from this ground as free from imperfection as any which could be obtained. He next considered the value of particular species in characterizing formations, and observed that in one country a species might spread all over a deposit, but never rise to those above, or have existed in those below; in another country it might range through twenty consecutive beds; no reliance can therefore be placed upon a single case, such as the occurrence of a coral in both the Silurian and Devonian systems. It has been said that not one carboniferous fossil occurs in the Silurian system, nor one Silurian fossil in the carboniferous; but in Devonian strata fossils of both these formations occur mixed, so that it appears that some Silurian fossils continued to exist till after the commencement of the Devonian series, and some of the carboniferous fossils began to exist earlier than its close; and in districts far removed some species of both formations may have commenced their existence at the same point of time. The Polyptaria of the Devonian and Cornish strata resemble those of the Silurian; and the Crinoidea and many Brachiopoda resemble those of the carboniferous system; whilst some forms manifest no analogy to either. Again, there are features in the combination of organic remains peculiar to certain districts. The organic remains so abundant at Petherwin, strongly and specially resemble those of the Fichtelgebirge, described by Count Münster. The fossils of North Devon and Cornwall often resemble those of the carboniferous limestone, whilst the South Devon corals resemble those of the Silurian system. The fossils of North and South Devon differ considerably, and the circumstances under which they existed seem to have differed. The fossils of South Devon seem principally analogous to those of the lower beds of North Devon, especially the corals; but from the very nature of coral reefs some species of coral might be prolonged under particular circumstances through long periods of time,

With respect to the arrangement of the ancient fossiliferous strata in one grand series, Mr. Phillips was not of opinion that all the terms have yet been obtained. When Mr. Murchison introduced his system of 400 new forms of fossils, the sequence was still incomplete; and now that another system had been introduced, with a probability of 500 more species, there might yet be on the continent more than one series of beds of which we have here no representatives. The Devon and Cornish strata may be one such series, not representing a whole geological interval; still less can it be said to be an exact equivalent of the old red sandstone, which is but a local interruption in the sequence of zoological affinities; and in examining the changes which have taken place upon the globe at large, we may find evidences of many such partial interruptions. Prof. Phillips concluded by recommending the study of stratified rocks, as the individual effects of one great series of changes which had gone on in regular sequence from the first appearance of organic life to the time when existing species first appeared in the tertiary deposits, and through the tertiary to existing conditions, and proposed to group the whole under three great classes, by the names of Palaeozoic, Mesozoic, and Cainozoic deposits, a classification depending wholly on general views of the associations of organic life, and yet really capable of being harmoniously compared with mineral characters taken on a large scale, and with a simple series of successively superposed strata, such as that formerly proposed by Mr. Conybeare.

Since the publication of the Report of Prof. Phillips's paper "On Fossil Crustaceans, &c." (*ante*, p. 599), we have received the following note:—

Clifton, Bristol, 18th Aug. 1841.

Perhaps it may be interesting to your readers to know that the little Cypridiform Entomostraca, from the lower limestone shales of Pembrokeshire, to which I called the attention of the Geological Section of the British Association at Plymouth, have a wider geographical range than I then presumed to indicate. I have had the pleasure, to-day, of recognizing them, very distinctly, in the same geological place, below the great mass of mountain limestone, and above the old red sandstone, on the bank of the Avon, about one mile west of the Hotwells.

Yours, &c.,
JOHN PHILLIPS.

SECTION D.—ZOOLOGY AND BOTANY.

Prof. OWEN gave an account of a *Thylacinus*, the great dog-headed opossum, and one of the rarest and largest of the marsupial family of animals. At the present day it existed only in Van Diemen's Land, though formerly it had a much more extensive geographical distribution. For his knowledge of the anatomy of this animal Mr. Owen stated that he was indebted to Sir John Franklin, who had kindly preserved and sent him a specimen in spirit, and he believed this was the only specimen extant in Europe. In its habits it was carnivorous; holding about the same relation to the other marsupials that the carnivora did to the whole of the mammalia. It was a great pest to the shepherd in its native districts; and in its low intellectual character, and its craft and cunning, very much resembled the wolf. In destroying sheep, it does not feed on them at once, but proceeds to worry, if possible, the whole flock, first tearing one and then another. Its smell is very powerful. It has a narrow head, a large number of incisor teeth, with the molars all alike. Its bony palate is very defective, thus presenting a lower organization than any of the carnivora of Europe. Its internal organization agrees with that of *Dasyurus*. Its external organization presents nothing remarkable. It has the pouch so remarkably characteristic of the whole order of these animals. The reason of the existence of this pouch might be to enable the animal to carry its young great distances more easily, as it was obliged to travel far in seasons of drought in search of water. Both male and female possess this pouch in the whole family, in the former less evident. In *Thylacinus* the pouch is more developed in the male than any other genus.

Mr. J. C. BELLAMY made remarks "On the Distribution, &c. of the Mammals of Devonshire;" he exhibited a drawing of the palate of an individual of *Balaenoptera minor* (Knox), taken off Plymouth, and showed a portion of the baleine, and a part of the ear of that animal. He showed a new species of Vole, taken at Yealmon. He also displayed a tooth of an extinct species of elephant, from the Yealm

Bridge cavern; a species of *Asterias* unknown to him; a species of *Helix* new to the British isles; some *Helices* from the Yealm Bridge cave (proving their modern date); the skull of *Arvicola agrestis*, having teeth with fangs, instead of the common fluted condition; and several curious reliques of arvicole, birds, fish, &c. from the cavern of Yealm Bridge, which he discovered.

Dr. RICHARDSON stated, that the new *Helix* described by Mr. Bellamy, under the name of *H. subrescens*, had been seen by Mr. Gray, who found it to be the *Helix rivulata* of the continent. It had been found by Mr. Forbes in the Isle of Man, and also described by Turton.—Mr. COUCH observed, with regard to the white varieties of animals, he did not believe it depended, as frequently supposed, on cold. He knew in Cornwall a district in which a white variety of hares existed, and had propagated their race. The various species of Cetacea were not uncommon on the coast of Cornwall. He had seen some fifty or sixty feet long, and had often watched their actions by means of a telescope. The *Asterias* produced by Mr. Bellamy was new to him.—Mr. BALL believed the *Asterias* was described in Mr. Forbes's "History of British Star-fishes."—Col. SMITH related an instance of a number of specimens of the *Lepus Americanus* being shipped in America quite white, and at the end of twenty days they had turned quite brown. The hairs were not shed, and the change must have taken place in the hairs themselves.—Dr. LANKESTER observed, that unless more specimens of the *Mus intermedius* and *Arvicola hirta* could be procured, it would be very unsafe to admit them into the list of new British animals. A variety of circumstances might occur, producing the amount of difference which these specimens appeared to present.

Mr. P. F. BELLAMY read a paper descriptive of two Peruvian Mummies presented to the Devon and Cornwall Natural History Society by Capt. Blanckley, of the Royal Navy.—They proved to be the remains of children of different ages, one a few months old, the other not much more than one year; they were brought from the mountainous district of Peru, but at a considerable distance from the lake Titicaca. In conjunction with them were found certain envelopes (one of which proved to be an article of dress,) and the model of a raft or catamaran, two small bags containing ears of an undescribed variety of Indian corn, and two small earthen pots. He also exhibited a variety of other models found wrapped up with others examined by Capt. Blanckley. The skulls were found to resemble those adult specimens contained in the Museum of the Royal College of Surgeons in London, and presented the same peculiarities, viz. a short projecting face, square protruding chin, receding forehead, and elongated cranium. He stated, that he considered their formation to be natural, for the following reasons: 1st, that the peculiarities are as great in the child as in the adult, and indeed, more remarkable in the younger individual than in the elder; 2nd, from the great relative length of the large bones of the skull, all of which are elongated in a posterior direction; 3rd, from the position of the occipital bone, which occupies a place in the under part of the cranium; 4th, from the absence of marks of pressure, there being no elevation of the vertex nor projection on either side; and 5th, from there being no instrument, nor mechanical contrivance, suited for the process of compression, found with the remains. He called attention to the peculiar formation of the occipital bone, which consisted of five rudimentary portions; the fifth piece being placed between the occipital portion, commonly so called, and the two parietal bones. He considered the probability of the mummies being the remains of some of the true Titicaca race, deposited after the arrival of the original emigrants, who founded the Incas dynasty, and called on ethnologists to say what Asiatic people they resembled in manners, customs, and attainments; but if no affinity could be found, he considered it fair to attribute to the indigenes a mental capacity equal to the originating of such inventions, as the specimens connected with these mummies would indicate them to have been capable of. The extinction of the race he considered to have been gradual, and occasioned by an intermixture of blood with the followers of Manco Capac. Lastly, he suggested that the adult skulls called Titicacans were of two kinds, one being of the pure stock, the other of a spurious character, resulting from the

union of the indigenes with the settlers of Asiatic origin, and which present a modified form, there being added to the receding forehead and elongated cranium, an elevated vertex and flattened occiput, formed principally by an altered position of the occipital bone, which, instead of lying on a plane with the horizon, rises in a sloping direction upwards and backwards.

Prof. OWEN had carefully examined these skulls, and also those from Titicaca in the College of Surgeons' Museum. If they were of a natural form, they were the most remarkable in the world. They were not ordinary flattened heads. He believed, however, that it was artificially produced, and that it arose from pressure being applied all round the skull. Prof. Owen then pointed out a concavity existing all round the head, passing over the frontal, parietal and occipital bones. Pressure in the direction of this groove would, he believed, produce this shaped head. It was satisfactory to have these young skulls, as the modification of the process of ossification could be more evidently seen than in the older skulls.—Dr. RICHARDSON observed, that the different tribes of Americans had different modes of compressing their heads. He now possessed the head of an American chief, a man of great talent, and it was of the same shape as those on the table. Mr. Ball had just discovered a band amongst the materials on the table, which appeared to be used for compressing the head. On applying it over the head of the eldest child it seemed to fit tolerably well. It was, however, a little too large.—Dr. CALDWELL, of America, stated, that these were the most remarkable Indian heads he had ever seen. The projection of the upper jaw in these heads was most remarkable.—Prof. Owen observed, that in the head of the Guiana Indians, the upper jaw projected in the same manner.

Col. HAMILTON SMITH read a paper 'On the Cossal Sepiade.'—The author detailed all that was known at the present day of the existence of animals of enormous size inhabiting the ocean, belonging to the class of Cephalopods. However incredulous some naturalists might be with regard to the existence of these animals, the author had collected sufficient evidence to convince him that animals of a very large size belonging to this class now inhabited the waters of the ocean. The paper was illustrated by numerous drawings and one was a sketch of the beak and other parts of an enormous Sepia, still preserved at the Museum of Haarlem, where they were seen by the author.

Prof. OWEN thought this a subject worthy of attention. There could be little doubt of the existence of Cephalopods larger than were ordinarily caught. There were the parts of one in the Museum of the College of Surgeons in London, of very large size, which was taken in the Pacific Ocean by Banks and Solander. The beak and lips were very like those of that drawn by Col. Smith. The fins were of a rhomboidal form, enabling the animal to swim either backwards or forwards. Comparing the size of this animal, from the parts existing, with that of the smaller perfect animals, its body must have been at least four feet long, which, added to the tentacles, would make it seven feet in length.

Mr. PRIDEAUX exhibited specimens of copper from the bottom of a vessel which had been acted on by sea water, and was marked on its surface with small semicircular spots, which in many places penetrated through the copper. He wished to know if zoologists were acquainted with any animal that would produce this effect.—Mr. BALL suggested, that the marks and holes were produced by galvanic action. If scoriae of iron were present with the copper, this might take place. The semicircular appearance of the marks might be owing to the motion of the vessel through the water whilst the galvanic process was going on.—Dr. DAUBENY thought that Mr. Ball's explanation was correct.

Dr. DAUBENY exhibited to the Section a portable botanical press, which, by means of a small windlass, was capable of producing a great amount of pressure.

Dr. TRIPE exhibited some specimens of Pontia. In their marking they resembled *P. Rapae* and *P. Napi*, but were very much smaller. In some points of structure they differed from the large species. The club of the antennæ was less abrupt, and the wings were more square in their form. They had only been found during very hot and dry summers in one

locality near Whitsand Bay. In wet seasons they were never seen. They were mostly found feeding on the blackberry.

Dr. RICHARDSON read notices and exhibited drawings of three new genera of marine fishes from Van Diemen's Land, a full description of which will shortly be published in the Transactions of the Zoological Society.

Dr. CALDWELL read a paper 'On the Varieties of the Human Race.'—He considered that this subject had been too much neglected, and proceeded to give an example of how he thought it ought to be treated, by giving a comparative view of the anatomical structure of the African and Caucasian varieties of man. After dwelling minutely on the anatomical structure of the two races, he stated his conviction, that the former bore anatomically a nearer resemblance to the higher Quadrumanæ than to the highest varieties of his own species.

The Report of the Committee 'On the Growth and Vitality of Seeds' was then read, and the following suggestions for experiments on the conservation of vegetative powers in seeds, were recommended to be distributed amongst the members:—

These Experiments are intended to determine the following questions:—1. What is the longest period during which any of plant under any circumstances can retain their vegetative powers? 2. What is the extent of this period in each of the natural orders, genera and species of plants? and how far is it a distinctive character of such groups? 3. How far is the extent of this period dependent on the apparent characters of the seed; such as size, hardness of covering, hardness of internal substance, oiliness, mucilage, &c.? 4. What are the circumstances of situation, temperature, dryness, seclusion from the atmosphere, &c. most favorable to the preservation of seeds? Botanists and others are invited to undertake the following series of experiments, and to communicate the results to the British Association.

A. Retrospective Experiments.—1. By collecting samples of ancient soils from situations where vegetation cannot now take place, and by exposing these soils to air, light, warmth, and moisture, to ascertain whether any, and if any, what, species of plants spontaneously vegetate in them.—[N.B.—Care must of course be taken that no seeds obtain admittance into these soils from external sources,—such as the air or water introduced to promote vegetation.]—These ancient soils are either natural or artificial deposits. The natural deposits belong either to past geological periods or to the recent period.

a. The deposits of past periods are either secondary or tertiary.—[N.B.—There seems every reason to believe that the age even of the latest of these deposits is far beyond the maximum period through which vegetative powers can be preserved; yet as many accounts are recorded of seeds vegetating spontaneously in such soils, it would be well to set these statements at rest by actual experiment.]—In such experiments state the formation, and describe the geological phenomena of the locality, together with the depth from the present surface at which the soil was obtained.

b. Natural deposits of the recent period may be classed as follows:—Alluvions of rivers—Tidal warp land—Shell marl—Peat—Surface-soil buried by landslips—Ditto by volcanic eruptions. In these cases state the nature of the soil, the depth from the surface, &c.; and especially endeavour to obtain an approximate date to each specimen of soil, by comparing its depth from the surface with the present rate of deposition, or by consulting historical records. It would be well to submit to experiment a series of samples of soil taken from successive depths at the same locality.

c. Artificial deposits are as follows:—Ancient tumuli—Ancient encampments—The soil beneath the foundation of buildings—The soil with which graves, wells, mines or other excavations have been filled up—Ridges of arable land, &c.—In these cases state, as before, the depth from the surface, and ascertain from historical sources the approximate age of the deposit.—2. By trying experiments on actual seeds which exist in artificial repositories. These are—Seeds in old herbaria and botanical museums—Seeds obtained from mummies, funeral urns, at Pompeii, Herculaneum, &c.—Dated samples of old seeds from nurseries and seedsmen.—In these cases, state the circumstances in which the seeds have been preserved, and their date as nearly as it can be ascertained.

B. Prospective Experiments.—In this department of the inquiry, it is proposed to form deposits of various kinds of seeds under different conditions, and to place a portion of them at successive periods under circumstances calculated to excite the process of vegetation. In the case of certain species or families of plants, it would perhaps require many centuries to determine the limit of their vegetative powers, yet it is probable that a very few years would suffice to fix the maximum duration of the greater number, and that many interesting results might thus be obtained even by the present generation of botanists. It is proposed then to form a collection of the seeds of a great variety of plants (including, wherever it is possible, at least one species of every genus,) and to pack them up (carefully labelled) either alone, or mixed with various materials, as sand, sawdust, melted wax or tallow, clay, garden mould, &c. in various vessels, as glass bottles, porous earthen jars, wooden boxes, metal cases, &c., placed in various situations, as under-ground, in cellars, dry apartments, &c. At certain intervals increasing in extent,—say at first every two years, then every five, every ten, and at the lapse of a century, every twenty years, a small number (say twenty) of each kind of seed, from each combination of circumstances, to be taken out and sown in an appropriate soil and temperature, and an

exact register kept of the number of seeds which vegetate compared with those which fail. Should it appear desirable for this project to be carried out by the British Association, they might most effectually accomplish it by committing a collection of seeds, forming on the above plan, to some qualified person, whose duty it should be, in consideration of a small annual stipend, to take charge of them, and at stated periods to select portions for experiment, keeping an accurate register of the results. In this manner it is believed, that in regard to the large majority of plants, the limit of their vegetative durability would be determined in a very few years, and that a large mass of vulgar errors on this subject, which now pass for current facts, would be corrected and exploded.—[N.B.—The most effectual way of exciting vegetation in seeds of great antiquity is to sow them in a hot-bed, under glass, and in a light soil moderately watered.]

SECTION E.—MEDICAL SCIENCE.

The SECRETARY read a 'Report on Poisons,' by Dr. Rouppell. After alluding to his former communications on the same subject, the author stated that he would in this report confine himself to some views on carbonic acid, an agent of the highest interest from its injurious effects when applied in any way to the human frame, from its immediate connexion with the function of respiration, and from the analogy of its effects to some serious maladies. The effects of carbonic acid, when not eliminated from the lungs, he stated were much overlooked, whilst the action of other substances less deleterious had been much attended to of late. This gas, he stated, was eliminated, not only by the lungs, but also by the skin, by the serous and mucous surfaces, and that its quantity was much affected by many circumstances, more being given out by the lungs by day than by night, increasing by daybreak and diminishing at sunset; it is also increased by exercise, and during digestion. It is lessened by depressing passions, by debilitating causes, by low diet, and injuries to the par vagum. The effects of the gas, when injected into the veins and arteries, were detailed in experiments. When two ounces (by measure) were injected into the saphenous vein of a dog, the animal uttered cries of distress, became convulsed, lost its consciousness, and appeared to be dying. It felt, however, the stimulus of cold water, and recovered when thrown into the fresh air. When one ounce and a half were injected into the carotid artery, the animal became convulsed and foamed at the mouth; after forty seconds it seemed to recover, but again relapsed, lost all consciousness and power of movement, was quite insensible, and lay as if dead upon the floor. At intervals of a few minutes it was seized with violent spasm. This alternation of stupor and convulsions continued for four hours, when the animal regained its senses and the power of its limbs, appearing to suffer no inconvenience. From these experiments, and the well-known symptoms produced by its inhalation, the author concludes that the gas is intrinsically poisonous, in opposition to the opinions of M. Nysten and others, who deemed it negatively injurious, acting in the same manner as common air when injected into the blood vessels, and by its exclusion when inhaled. The author alluded to those diseases, the leading symptoms of which resembled the effects of carbonic acid, and stated them to be such as prevented the proper arterilization of the blood, such as emphysema of the lungs, and diseases of the heart; but the disease which most nearly resembled its action, and appeared its true prototype, he stated to be epilepsy, which was produced with all its terrors and depressing consequences, by plunging an animal into this gas, which appears to act on the medulla oblongata, for it annihilates volition and consciousness, which have their seat in this portion of the nervous centres, and is also the source of the respiratory movements, which the author conjectures may primarily and through life be excited by the stimulus of carbonic acid, and that the phenomena exhibited by narcotic poisons may depend on it. He has long laid it down as a rule, that opium is not to be exhibited when the blood is not properly aerated or carbonized; he also proved by direct experiment, that the quantity of carbonic acid given out by the lungs, is much increased when opium begins to exercise its characteristic effects on the system. In conclusion, the author stated, that the ideas expressed in this paper were stated with great deference to the meeting, and were advanced with the view of calling attention to certain interesting but obscure phenomena.

Dr. THEOPHILUS THOMPSON read a paper 'On the treatment of Rheumatism by Opium.'—After alluding to the introduction of this remedy in acute rheumatism by Dr. De la Roche, forty years ago, and

the recent revival of it by the American physicians and Dr. Corrigan, of Dublin, he detailed some cases which were treated by opium, after other constitutional remedies were made use of. The first was an urgent case of rheumatism, combined with affection of the heart and gastric inflammation, yet in nine days the strength was better than at the commencement. In another case, the patient had been worn out with previous attacks of rheumatism, and treated with every variety of the usual modes. During the first four days, he took seventy grains of opium in small doses frequently repeated, and at the end of a week he was able to attend to his professional duties. The conclusions derived from the cases were, that the remedy was safe, successful, and more speedy than the usual plans of removing the disease. The author advocated it not only on the grounds of experience, but also on physiological and pathological theory, contending that the pain and fever of rheumatism were more of a neuralgic than of an inflammatory character. He was aware that certain constitutional remedies were often previously necessary, which, if neglected, would not only render opium unsuccessful, but even injurious.

Mr. SQUARE had used opium extensively, but combined it with calomel, as by the combination he deemed that he prevented, or removed if it existed, the most fearful accompaniments or consequences of rheumatism, endocarditis and pericarditis. — Prof. WILLIAMS thought that the complications of the disease were best met by the combination of calomel with the opium: one effect of the opium was remarkable, that it increased the deposit of lithic acid, the elimination of which might prove the means by which relief was obtained. — Dr. SARGENT had heard the cases with much interest, but he could not deem them, nor anything he had heard from the advocates of the proposed plan, as decisive, though he had certainly come to the conclusion that narcotics, particularly opium, might be used with more freedom and safety than had been usual; but he could not feel warranted in trusting altogether to opium, where the deeply important cardiac diseases were of so frequent occurrence, both during and after acute rheumatism.

Dr. KIDD (of Armagh) rarely found the disease uncomplicated with severe visceral derangement, and thought that any exclusive plan of treatment would be found injurious in so complicated an affection.

Dr. D. B. REID gave some demonstrations of his mode of ventilating ships, and made some remarks on the results of his investigations on the subject by an extensive series of experiments. The arrangements adopted in the steam ships of the Niger Expedition, for the purpose of ventilating every part of the vessels, were shown and explained by diagrams, without which the explanation could not be easily comprehended.

Mr. SQUARE read a paper on Empyema, and detailed the particulars of a case, which was accompanied by the expectoration of a large quantity of pink fetid pus, and an external abscess formed, through which the whole of the matter contained within the pleural cavity was discharged, when the expectoration ceased, and the patient ultimately recovered. Along with the ordinary physical signs of Empyema, before the evacuation of the matter, there existed gurgulment, pectoriliquor and cavernous respiration, under the clavicle of the diseased side. These, the usual signs of a tubercular cavity, ceased on the evacuation of the matter, when metallic tinkling was developed. The therapeutic operations of nature were principally relied on in conducting this case to a favourable termination.

Dr. M'GOWAN detailed a case of Empyema, which was treated so far successfully by the operation of paracentesis thoracis, that the patient recovered his general health to a considerable degree, but the opening into the thorax never closed, and still, after a considerable lapse of time, pus to the amount of from eight to sixteen ounces is occasionally removed through the canula, which is retained in the opening.

— Dr. WILLIAMS deemed Mr. Square's case of great value: such cases, he believed, occurred often, but have not been sufficiently described. When the physical signs of phthisis occurred in cases where chronic pleurisy existed, he thought them very equivocal, and would rely more on constitutional symptoms. The lung compressed, not against the roof, but against the upper part of the anterior of the chest, with the

larger tubes pervious, would give rise to those stethoscopic phenomena observed by Mr. Square.

Mr. BENNETT LUCAS read a communication on the existence of two fascia on the eyeball, which he named *Sub-conjunctival* and *Sub-muscular*, from their positions, the former beneath the conjunctiva, the latter between the muscles and the sclerotic coat of the eyeball.

Dr. FOWLER submitted 'Some Observations on a case of Deafness, Dumbness and Blindness, with remarks on the Muscular Sense.' The case was that of a young woman in the Rotherhithe workhouse. She was born deaf and dumb, and was blinded by small pox when about three years of age; she is now about twenty. She does not hear the loudest efforts of the voice, but starts on a poker hung by a string against her ear being struck against a grate. Touch is the only sense by which others seemed to communicate with her, or she employed in examining persons or objects. She possessed both taste and smell, but did not appear to have used them. Until the period of puberty, her existence appeared merely animal, but then a marked difference appeared in her habits. She became as attentive to her dress and personal decorum as any other girl. She feels her way without a guide to every part of the workhouse,

recognizes all its inmates by the feel of their hands—makes her bed—and sews, not only plain work, but even the more intricate parts of dress. She is very tenacious of what she deems her own, and was much pleased with shilling which was put into her hand, smiling, curtseying, and feeling it eagerly for some time after. The author deems the true key to so much and minute information derived from touch alone, to be the development of the *muscular sense*, by which all the exquisite adjustments of the artisan, the musician, the sculptor, the painter, and even the orator, are regulated. Several instances of this sense were given in the lower animals, and practical suggestions made for its application in educating the deaf and dumb, particularly when complicated with blindness.

Sir D. DICKSON submitted a series of cases on Hepatic Abscess.

SECTION F.—STATISTICS.

Mr. W. NEILD (Mayor of Manchester) read a comparative statement of the Income and Expenditure of certain Families of the Working Classes in Manchester and Dukkenfield, during the years 1836 and 1841. The general results are contained in the following tables:—

Income and Expenditure of Twelve Families in Manchester.

No. in Family.	Trade.	Income per week.		Expenditure in Food per week.		Left for Instruction and Purchase of Goods.		Going back in the world.	
		1841.	1836.	1841.	1836.	1841.	1836.	1841.	1836.
9	Machine Printer	4 7 0	2 15 8	2 6 8	1 11 4	2 0 4			
10	Millwright	4 10 0	2 9 7	2 2 2	2 0 5	2 7 10			
2	Watchman	0 15 2	0 13 4	0 11 9	0 1 10	0 3 5			
8	Stoveman	2 17 0	2 0 1	1 12 2	0 16 11	1 4 10			
2	Washer	0 14 0	0 11 4	0 9 10	0 2 8	0 4 2			
6	Overlooker	1 14 0	1 7 10	1 4 3	0 6 2	0 9 9			
4	Labourer	1 2 0	0 19 0	1 16 9	0 2 11	0 5 3			
4	Labourer	1 1 0	1 1 3	0 18 4		0 2 8	0 0 3		
10	Dyer	2 0 0	1 19 0	1 12 0	0 1 0	0 8 0			
5	Blue-dipper	1 0 0	1 0 8	0 17 9		0 2 3	0 0 8		
7	Watchman	1 1 0	1 10 0	0 19 1		0 1 11	0 0 10		
9	Dyer	1 3 0	1 10 0	1 5 2		0 7 0	0 2 2		
Total.....		22 4 2	17 9 8	14 15 11	5 3 3	7 10 5	0 8 9	0 2 2	

Income and Expenditure of Seven Families in Dukkenfield.

No. in each Family.	Trade.	Income per week.		Expenditure in Food per week.		Left for Instruction and Purchase of Goods.		Going back in the world.	
		1841.	1836.	1841.	1836.	1841.	1836.	1841.	1836.
3	Power-loom weaver	0 14 4	1 1 6	0 17 4	0 16 0	0 5 5	0 3 0		
6	Dresser	1 4 0	1 17 0	1 1 1	0 18 2	0 2 10	0 18 9		
6	Labourer	0 18 8	1 6 0	1 4 3	1 0 11 1	0 7 0	0 5 7		
3	Card-room hand	0 8 8	0 13 0	0 11 4	0 9 9	0 3 3	0 2 8		
4	Spinner	0 14 4	1 1 6	0 19 2	0 16 10	0 4 8	0 4 10		
4	Warehouseman	0 10 8	0 16 0	0 14 6	0 12 9	0 3 3	0 3 10		
7	Assistant Mechanic	0 16 0	1 3 0	1 0 42	0 17 9	0 5 3	0 3 7		
Total.....		5 6 8	8 0 0	6 8 3	5 12 3	0 2 10	2 7 8	1 3 7	

Mr. PORTER then read an account of the Monts de Piété of Rome, Paris, and other cities on the continent. He stated that an institution of the kind had been formed at Rome before the Christian era by the Emperor Augustus, but that it was in the eighteenth century that they were revived in modern Italy under the patronage of the Popes. The system was supported by the Franciscans, and opposed by the Dominicans, until the matter was set at rest by Leo X. who declared lending-houses to be legal and useful, a decree subsequently confirmed by the Council of Trent. From an old Italian work, entitled 'The Pious Institutions of Rome,' published in 1689, he gave the following account of the origin of the Monte di Pietà:—The work was so rare that he could not purchase a copy, but had been permitted to make an extract.

The original founder of this great work of benevolence in Rome, was Padre Giovanni Calvo, a Franciscan of the order of Minorites, who obtained the sanction of Paul III. for an association of some persons of distinction, whom he had united for this object. This pontiff not only approved the institution of the present sacred Monte di Pietà, but assisted the undertaking with money, enriched it with indulgencies and privileges, and conferred on it all the favours enjoyed by similar institutions. The sacred Monte di Pietà has for its object the advance of sums of money, in each case not exceeding thirty crowns, to poor and necessitous persons of every description, on the security of pledges. This is accomplished as individuals, actuated by benevolent motives, supply funds to the institution, or apprehensive of danger if they retain

money at home, deposit it with the establishment for greater security. The pledges which are taken from day to day are retained eighteen months, after which, if the owner fails to claim them, they are sold publicly and fairly, by auction. The proceeds are applied to satisfying the claims of the establishment, including interest at two per cent., and the surplus is returned to the owner of the pledge. The institution is governed by a fraternity, which every year elects forty of its members as directors. The directors meet weekly, to deliberate on all that is required for the maintenance of the establishment, which may be regarded as the common patrimony of the poor and the great mansion of all." The document then set forth the favours which had been shown to the institution by successive popes, ending with the promulgation of its statutes by Alexander VII. Mr. Porter stated, that as he was anxious to obtain some information respecting the founder of this institution, he applied to the General of the Franciscan order, and obtained from his secretary the following extract from the records of the Franciscan monastery at the Arrabbiati in Rome:— "1541 John Calvus, son of Calvus, was a native of the kingdom of Corsica, and educated in the province of Corsica. He was a man renowned for his learning, skill, and suavity of manners. He held the office of commissario in the court of Rome; he was selected at the general assembly at Mantua, to regulate the whole order of Franciscans. He was the first person to institute the Monte di Pietà. He was eminent for a two-fold apostolic office; he was theological advocate at the Council of Trent; he was esteemed by Paul III., and by the kings of France

and Lusitania. He died at Trent 21st of January 1547, having held office about six years." The following table shows the state of the Monte di Pietà in Rome, for the year 1839:—

1839.	Number of Articles.	Amount Lent.			Average amount on each article.
		Italian money.	English equivalent.	s. d.	
Remaining in store, Dec. 31, 1838.	94,072	340,849 90	80,165 11 8		
Pawned in 1839	306,161	925,327 10	211,554 2 1	14 2 1	
Total.	401,033	1,275,177	291,719 13 9		
Redeemed.	287,234	891,259	203,746 17 1	14 2	
Remaining in store, Dec. 31, 1839.	113,799	383,918	87,972 16 8		

Amount of capital in the Monte di Pietà department, (in English money) £104,360 8 11. Amount in actual circulation 31st Dec. 1839 87,972 16 8.

Balance in hand. £16,387 12 3

The greatest amount lent in one sum £2,750 0 0. The least 0 0 10 1/2. Expense of management (90 persons being employed) 6,432 9 7. Net profits 4,761 12 6.

The following return shows the state of the Banking department, which was joined to the Monte di Pietà in 1839:—

Total amount lodged in 1839. £430,755 3 4. Amount of drafts in 1839. 407,536 15 10.

Increase of capital in 1839. £31,218 7 6

The institution is divided into three departments, called Primo Monte, Secondo Monte, and Terzo Monte. The first and second are for the reception of goods on which the amount borrowed does not exceed a scudo, (4s. 7d.); the third is for articles of higher value. The net profits for 1839 do not include a large class of the borrowers, as the institution lends, without interest, to the poor, sums not exceeding a scudo; and to this class of borrowers 18,333. 6s. 8d. was lent in the year 1839. The expense of management does not include pensions which are given to about thirty retired officers, and to the widows and orphans of such as have died in the service of the institution. Officers are obliged to lodge five per cent. of their salaries for a retired fund. After forty years of service they may retire on full pay, and on half pay after twenty years of service. The poor are not the only persons benefited by this institution; merchants, traders, and even crowned heads have taken advantage of it. Among the articles in pawn, Mr. Porter saw a diamond-ring, a suite of pearls, a snuff-box with a likeness of Louis XVIII. set in pearls, a coronation medal, and many similar articles. He had been intrusted with the secret of the ownership, but of course could not betray the confidence reposed in him. Not more than one-tenth of this valuable description of property is ever sold, nine-tenths being the average of the releases from the Terzo Monte. The government of the Monte di Pietà is intrusted to a protector, who is the treasurer of Rome for the time being. Mr. Porter gave a brief account of the similar institutions at Turin, Leghorn, and Genoa, but entered into more detailed statements respecting the Mont de Piétat at Paris. The following table shows its operations for the year 1840:—

Mont de Piétat de Paris.—Operations for the year 1840.

Pledging Department.	No. of Articles.	Amount Lent.		Average amount on each article.
		Frances.	£. s. d.	
Pawned.	1,920,692	19,576,020	743,040 16 8	£0 12 2
Renewed.	241,130	5,763,627	230,553 1 8	0 10 9 1/2
Total.	1,461,822	24,339,647	973,593 18 4	
Releasing Department.				
Redeemed.	1,090,119	16,362,143	654,485 15 0	£0 12 0
Renewed.	241,130	5,763,627	130,553 1 8	0 10 9 1/2
Sold by auction.	98,178	1,641,575	65,663 0 0	0 13 4 1/2
Total.	1,429,427	23,767,545	950,701 16 8	

When pawns are renewed, the goods are revalued, and the borrower is compelled to make compensation for their deterioration.

State of the Magazine of Pawned Goods at Paris, 31st December, 1840.

Remaining in store, 31st Dec. 1839.	No. of articles.	Value.	
		Frances.	£. s. d.
31st Dec. 1839.	600,347	15,311,359	612,456 7 6
Pawned in 1840.	1,461,822	24,339,647	973,593 18 4
Total.	2,262,169	39,651,206	1,506,050 5 10
Lent out of store, redeemed, or sold.	1,429,427	23,767,545	950,701 16 8
Remaining in store, 31st Dec. 1840.	832,742	15,883,661	735,348 9 2

Average Daily Transactions.

	Articles.	Amount.	
		Frances.	£. s. d.
Pledges.	3,840	59,655	2,485 12 6
Renewals.	735	17,505	739 7 6
Releases.	2,830	42,998	1,791 11 8

Connected with the Paris Mont de Piétat are four depots managed by commissioners, who have a certain profit on every transaction. The importance of such an accommodation appears from the following estimate:—

In every 100 pawns, 9 are by the public, and 91 by commission.

100 renewals, 40 by the public, and 60 by commission.

100 releases, 44 by the public, and 56 by commission.

The interest charged by the Paris Mont de Piétat is 9 per cent., and one-half per cent. for valuation. The number of watches in pawn is generally from 250,000 to 300,000. There were over 6,000 matresses in store, and the Directors had resolved to admit no more. Mr. Porter concluded by stating, that, in 1839, a sum equivalent to 7,821. 13s. 4d. had been given from the Paris Mont de Piétat for the support of the hospitals.

Papers containing portions of a return of the Stipends of the Clergy of the Established Church in Scotland, were presented to the Section; but as they were incomplete they were not read. From them it appeared, that the average stipend of a clergyman in Berwick is 26s. per annum, in Roxburghshire 28s., and in Haddington 30s.

Prof. QUETELET then addressed the Section in French, on the importance of keeping exact registers, in different districts, of the facts described in the following table:—

1. Meteorology.

Pressure of air.

Temperature.

Humidity.

Electricity.

Force and direction of winds.

Quantity of rain and snow, &c.

State of the sky.

Meteors, falling stars, &c.

2. Physics.

Magnetism of the earth.

Temperature at different depths.

Ditto at sources and mouths of rivers.

Temperatures of vegetables and animals.

Phenomena of tides.

3. Chemistry.

Analysis of air.

of rain water.

4. Botany.

Budding of plants.

Flowering.

Fructification.

Shedding of leaves.

5. Agriculture.

Epochs of rural labour.

of vegetable maturity.

of hay-making.

of vintages.

6. Zoology.

Arrival & departure of birds, insects, &c.

of fishes.

Entomological phenomena.

Reproduction of animals.

Mortality.

7. Man.

Births, and all their circumstances.

Deaths, and all their circumstances.

Diseases, and their duration.

Crimes.

Consumption of food.

Letters.

Traffic and travelling on roads.

on canals.

in harbours.

Spring-knife hafters. 1,400

Scale and spring forgers. 150

Blade-forgers. 300

Pocket-blade grinders. 100

Pen-blade grinders. 300

Apprentices. 600

Total. 2,800

In the first manufactories of the town, the average of wages is from 16s. to 25s. per week; but in many inferior manufactories they receive only from 12s. to 16s. The tools required by these men are few and simple; and hence, in periods of distress, they manufacture for themselves, and sell the goods to hardware dealers, &c., which produces still greater depression in the trade. These operatives marry early, and have generally large families. The file-trade employs 1,420 men, 700 boys, and 100 women: the wages vary considerably, as the work is paid by the piece; but the following is the average:—

Forgers—Double-hand, average. £2 19 7^{1/2}

Single-hand. 1 11 10

Saw-fie. 1 3 7

File-cutters—A man, average. 1 2 6

A man and boy. 1 11 8

A man and two boys. 2 0 6

A grinder. 1 14 0

Ditto, with a boy. 2 7 4

Scourer (a woman). 0 9 0

* Foreman, 11. 12s. 10d.; Striker, 11. 6s. 9d.

The filers are inferior to the platers, but are superior to the grinders, &c. The number of clubs among the operatives in Sheffield is 56. The numbers in 39 only amount to 7,978; and the whole stock, belonging to 38 clubs, is 53,373. There are no accounts of the numbers in 17 clubs, and of the funds in 18. The number of secret orders is 36, containing 2,940 members.

SECTION G.—MECHANICAL SCIENCE.

Report of the Committee, consisting of Prof. Moseley, Mr. Enys, and Mr. Eaton Hodgkinson, for applying a Principle of Dynamometrical Admeasurement, invented by M. Poncelet, to the con-

struction of a Permanent Indicator for Steam Engines.'

The registration of the work done by the steam at the piston of a steam-engine, is a most important practical question, being applicable to every variety of engine, and showing the absolute work, independent of friction and other resistances, to which the working parts are subject. The advantages which have resulted from the accurate knowledge of the duty in Cornish engines, are well known. The registration effected in these engines was comparatively easy, from the constant nature of the work which is performed; and the invention of a method which can be extended to all engines, whatever the nature of the work upon which they are employed—whether fixed engines or locomotives—was a question of sufficient importance to justify the appointment of a Committee by the British Association, and the placing a grant of money at the disposal of that Committee. The only instrument at present in use is the Indicator of Watt: on the insufficiency of that instrument for the purposes contemplated it is unnecessary to dwell. The principle of dynamical measurement first proposed by M. Poncelet, and described in his 'Mécanique Industrielle,' and in M. Morin's 'Description d'Appareils Dynamométriques,' seemed peculiarly adapted for the objects in view. The application made by M. Morin was to an instrument for registering the work done by a team of horses dragging a loaded carriage. Two strong springs are fastened together at their extremities, and the separation produced in these springs by the traction of the horses—which separation is, within certain limits, always proportional to that traction—furnishes the means of measuring the tractive force exerted. (The Report then proceeds to describe, by reference to drawings, the construction and action of the apparatus.) The motion of a certain wheel, during any finite time, is proportional to the sum of the products of each elementary space described by the carriage, multiplied by the particular force of traction under which that elementary space is described, so that the whole space moved over by this wheel is directly proportional to the whole work, or dynamical effect expended in moving the carriage over that space, however varied the traction or the velocity may have been. The principle which combines the motions in the machine is, in fact, the complex operation known in analysis as integration. The attention of the Committee was directed to the application of this principle of mechanical calculation of M. Poncelet to the registration of the work of steam-engines; but the Indicator now presented and described by the Committee (see See. A, p. 671,) has nothing in common with the apparatus alluded to, except the principle. The design of the Indicator was given by Prof. Moseley, and its execution placed under his direction. An alteration of considerable importance in the mechanical construction was made at the suggestion of Mr. Dutton, of Manchester, and the instrument, in its present form, was placed on an engine of Messrs. Fairbairn & Murry, at Mill Wall, and answered all the mechanical functions assigned to it with entire precision and accuracy. During the ensuing year the Committee will proceed to apply the Indicator to the engines whose work is registered by other means, and to compare the two registrations, and hope to be enabled to lay before the next meeting of the Association a considerable accumulation of results, obtained by trials of the instrument under a variety of different circumstances.

'On a System of Trussing for the Roadways of Suspension Bridges.'

Mr. Rendel placed before the Section a model of the Montrose Suspension Bridge, the roadway of which had been recently restored, and a peculiar system of trussing adopted. Suspension bridges were peculiarly subject to undulatory motions, which proved extremely destructive to them. These undulatory motions arise from the action of the wind, and the circumstances are such that the wind may tend to raise the roadway at one end, and depress it at the other; and various means had been devised to prevent these motions. In 1833 a considerable portion of the roadway of the Montrose Bridge was destroyed, and Mr. Rendel being employed to restore it, it struck him that, if great stiffness were given to the roadway by a system of longitudinal trussing, the desired object would be attained. He adopted,

therefore, a system of vertical and longitudinal trussing, extending above and below the line of the roadway, so that the neutral axis of the truss is in the roadway. This had succeeded most completely. In an ordinary gale of wind, the original roadway would be subject to a wave of from three to five feet in height, but he was satisfied that the present roadway is not subject to a wave of as many inches. The weight of the roadway has not been increased by more than five or six per cent.

'On the Plymouth Breakwater,' by Mr. Wm. Stuart.

The importance of a breakwater at Plymouth attracted the attention of the Admiralty in 1806, and in February of that year Mr. Rennie and Mr. Whidbey, the Master Attendant of Woolwich Dockyard, were directed to survey the Sound. As the results of their survey, they submitted a plan for a stone breakwater, and gave their opinions upon several plans previously proposed. The stone breakwater was to be 1,700 yards in length, at the top of which the middle was to be straight for 1,000 yards, and each end, 350 yards in length, was to incline at an angle of about 20° to the straight part: it was to be ten yards in width at the level of ten feet above the low water of an ordinary spring tide, with a slope of three to one on the south or sea side, and one and a half to one on the north or land side; and to be constructed by blocks of limestone thrown promiscuously into the sea on the intended line, with the top of cut stone. This plan was favourably received, and an Order in Council issued in June 1811, for the execution of the work, and in August 1812 the first stone was deposited. Mr. Stuart then described in detail the progress of the work, and the various alterations found advisable. The south slope is regularly formed with blocks of granite, from the level of low water spring tides, with a slope of five to one, and the north side with blocks of limestone with a slope of two to one. A lighthouse is now being added to the western end, and a buttress for the protection of the lighthouse, and securing the front of the south slope. The force of the sea is so great, that stones of fifteen or even twenty tons have been taken from low water and carried over the top of the work. According to the original calculation of Messrs. Rennie and Whidbey, 2,000,000 tons would be required for the work, but, owing to the various extensions, the quantity is much increased; and between the 12th of August 1812, and the 31st of July 1841, 3,377,068 tons had been deposited. The estimated cost of the original breakwater was 1,013,900*l.*; the whole outlay to the present moment is 1,111,700*l.*, and the cost of the breakwater when completed, including the lighthouse, will not exceed 1,300,000*l.* Various other breakwaters have been proposed to the Admiralty: one of cast iron in 1804; two of stone, and one of wood, by Mr. Bentham, in 1811. The wooden breakwater was to consist of 117 floats of wood, of a triangular or prismatic form; each float thirty feet in breadth and depth, forty feet in length, to be moored by iron chains, at a cost of 201,805*l.*; but the Admiralty resolved on a stone breakwater, and the thirty years experience since elapsed have confirmed the author in his opinion of the wisdom of the choice. The stone breakwater is said to have occasioned an accumulation of mud and silt within the harbour, and a consequent diminution in depth of the water to the extent of five feet. In the original report of Messrs. Rennie & Whidbey, is contained the following statement:—

"From conversing with pilots and various other intelligent men whom we met at Plymouth, we have reason to believe, that the depth of water in the Sound is on the decrease, by the settlement of mud and silt brought down by the rivers from the interior country, and also by the embankment of the mud lands within, thus diminishing the ancient receptacles of the water of the tide, which both in its flux and reflux occasions a powerful scour in its passage through the Sound." —The fact is, that a recent enclosure of 275 acres of the backwater of the Catwater above the Lara Bridge had just taken place; it seems evident that mud and silt were then in the Sound. On a consideration of the whole question, Messrs. Rennie & Whidbey were of opinion that there was no danger of the Sound becoming more shallow, and that no further deposition of silt or mud would take place, except immediately within or without the breakwater. In consequence of a communication, made in July 1838, to

the naval authorities at this port, to the effect that a deposit was then going on in the Sound, the Admiralty directed Mr. James Walker to report fully on the subject, and the best means for providing against the apprehended injury to the anchorage. After a long and laborious investigation, and a minute survey, during which no less than 2,000 soundings were taken, Mr. Walker reported, that, taking the mean of the soundings that could be affected by the breakwater, the result was that there was but very little increase or decrease, and that, if there was any decrease of depth in the Sound (except close to the breakwater, and which could produce no practical evil), this was certain, that if it had taken place, it was but small,—certainly not enough to cause alarm, or to justify expensive measures for removing the cause. As to the destruction of the breakwater by the pholas, though connected with the breakwater since its commencement, Mr. Stuart never saw a perforation in the limestone by the pholas, except between the low water of spring and of neap tides; and these perforations only occur on the outer surface of the stone, and to a depth not exceeding three inches. He never discovered any such perforation in the interior of the work, although he had recently had occasion to remove stones, by the aid of the diving-bell, at the depth of five feet below low water, and which had been deposited there upwards of twenty-five years. Loose stones had been taken up from beaches, and from the bottom of the Sound, perforated by the pholas, but they must have been perforated before they got there, for the pholas had never, in such cases, been found alive.

Capt. TAYLOR, R.N., explained, by reference to a model, his construction and application of a shield to protect the paddle-wheels of steam-boats from the shock or action of the sea, when riding at anchor, or sailing or scudding under canvas when the steam power is not applied. Also his method of disconnecting the paddles without stopping the engines. He also proposed to apply the steam power of vessels for the purpose of working the windlass.—Mr. WHITWORTH gave an account of 'A New Construction of Die Stock for Cutting Screws'; Mr. D. LAING of 'Smith's Wire Ropes,' and Mr. BROCKEDON of his 'Application of Caoutchouc as a Stopper for Bottles containing Liquids.'

TO CORRESPONDENTS.—Though well pleased to be enabled to present, exclusively, to the public, such copious extracts from the forthcoming Memoirs of Madame Laflèvre, we confess that the opportunity offred itself at a most perplexing moment, and we must, in consequence, apologize to advertisers for having this week omitted all advertisements not of temporary interest, that we might conclude our Report of the proceedings at the British Association. This enforced us to speak of ourselves, we may, perhaps, be excused, if we say a few more words on the subject. A Contemporary has been for the last month sighing forth his long suffering from evil reports about trade influences. Now, if any of our misdeeds be referred to, his sufferings must, indeed, have been of long standing, for it is ten years or more since this journal came into our hands, and that we blazoned forth—somewhat ostentatiously perhaps, but in simplicity and truth—our resolution to put down the bad power of trade and coterie criticism. Since then we have never lost sight of this paramount duty—we have never ceased in our endeavour to strengthen the public judgment, to induce a more vigorous and manly tone of thought, and a healthier patronage of literature: but we have said very little on the subject, content to do our spurring to the best of our ability, and trust to the issue. The "pining atrophy," of which our contemporary complains, and which has, it appears, led the great publishing proprietors to back out of the concern altogether, is proof that our confidence was not misplaced. So far well: and, assuming that our contemporary be now free from sinister and misleading influences, we wish him success. There is room for both of us. But before he starts in the second heat, let him consider whether it was altogether the weight of a bad character which lost him the first,—whether other changes which have come over literary periodicals may not deserve attention. When the *Athenæum* came into the hands of the present proprietors, it was, like all of its kith and kin, very loosely printed, with a waste of margin, and sold at 2*d.* We reduced the price at once to 4*d.*; by enlarging the printed page, and by other mechanical arrangements, we added altogether about one-seventh to its typographical contents. We still found ourselves cramped and cabined for want of room, and gave double numbers; these have gone on progressively increasing, and last year there were no less than 26—equal to one every other week. Now these are facts that he ought not to lose sight of; and it would be a pleasant arithmetical question for his young friends to determine.—What is the comparative price at which literary matter equal to the contents of the original *Athenæum* is now sold? Let them take, if they please, the present Monthly Part, of 96 pages, the price of which is 1*s. 4d.* It is because we wish him success that we direct his attention to these matters. He who hopes to succeed must work in the spirit of the age.

Lexicon—J. K. received.

